

SEQUENCE LISTING

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Cole, Stewart T
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<120> THE MYCOLACTONE LOCUS: AN ASSEMBLY LINE FOR PRODUCING NOVEL
POLYKETIDES, THERAPEUTIC AND PROPHYLACTIC USES

<130> D 22 869

<150> US 60/519 864

<151> 2003-11-14

<160> 12

<170> PatentIn version 3.3

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<212> DNA

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<223> Nucleic acid sequence of the coding sequence of mlsA1 gene.

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<210> 4

<211> 987

<212> DNA

<213> *Mycobacterium ulcerans*

<220>

<223> Nucleic acid sequence of the coding sequence of mup045 gene.

<400> 4

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attaatgata tccaggTcGA cggtgttccg aatgatcata ctatcgTgCA atccgattac 120
atTCCTTCA ccgaAGCCGA tgagccggct acagtcatgg ccacgcgcgc tgcaaccgaa 180
gcgcTgacca cttccgagct agtatccgct gatgttggcg tcttgatata tgccgcgatc 240
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gatgcgcTgg cattcgaact ttccgcagca agtaacggtg gaacacaagg catgcagtt 360
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aataAAACAT CCTGGGGTTT gctaaGACAAttggccacg ttggagcttgc gatcccctg 840
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ggcgtcccc gacactccac ttcgtag

987

<210> 5
<211> 1314
<212> DNA
<213> *Mycobacterium ulcerans*

<220>
<223> Nucleic acid sequence of the coding sequence of *mup053* gene.

<400> 5
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gcggcccccgc tgggcgacgt gcagtcgcgg ctggtggcag atcccatggt tatggcaaac 120
ccggcgccat tttgcgatga attgaggcgca atcggccctg tgggtgcag ctacggcacc 180
cacctcgctcg ttagtcatgc catgccccat gaactgcttc ggtccgaaga cttcgaagtg 240
gttcgcgtcg gatcgaactt gccggcacca atgcgtggc tagagcgcgg cactcgggac 300
gatacgcccc atctgctgct gccgcccgtcg ttgctggccg ttgagccgccc gaatcacacg 360
cgctatcgca aggcaagtgtc ctccgggttc acgccgaaag cagtagccgg attacgcgt 420
catgtcgaag agactgcgtc ggccgtgtt gatcagctca ccgaccaggc tagtgcgtc 480
gacatcatag cccgctactg ctcccagctg ccggcgccgg tcatttgta catcttaggc 540
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gattttgggc tcacatggcg tcagcaccag caggtgcggc aagggtccca aggactccac 660
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gacatcacac gagccaaacgc caaccggcat ctgcatttc ccgggtggccg ccacttctgc 1140
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ttccctgacg tgcgcgcgc aggccccggaa aatagacgtg atactcgaac tctgcggggt 1260
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<210> 6
<211> 906

<212> DNA

<213> Mycobacterium ulcerans

<220>

<223> Nucleic acid sequence of the coding sequence of mup038 gene.

<400> 6

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gcactagtcg	ccgaacccga	tcaggagcct	aaggccgtga	tcttagccct	gcatggcggt	120
gccaccaacg	cgcgttattt	cgactgcctt	ggccaccgcg	cgcttccct	gctgcacacc	180
ggcgcggcgg	cgggattcac	cgttgtggcc	cttgaccggc	coggctacgg	cagctcggcg	240
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gatcgcatcc	tggcgcagcg	gccacgcggg	gccgggtgt	tcataatggg	ccattcaaac	360
ggatgcgaac	tggcgatgtg	gatggccacc	gagacgcgcg	gtgcccagct	gctcgccatc	420
gagttggctg	gtaccggctg	gcattatca	cccgaggccc	gagaaatcct	gacaacggcc	480
actggtaac	atcggtgggt	gggcctctat	gattgtct	ggcatccgca	gcggctatac	540
ccgccccagg	tcctcaacgc	ggccatcatt	tcttcgtccg	ccccggccta	cgaggagcag	600
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gtacatttca	gcatcgccca	acacgaaaag	gtttggcagc	gcatagttc	agcgctagat	720
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ggacacaaca	tcagcctggg	ccacaccgc	ggcgactacc	acacgacagt	cctgtcggtt	840
gtccagcaat	gtctggccga	acggttggcc	aacgcgcaac	aagatgtcga	tctcgccggcc	900
gagtga						906

<210> 7

<211> 16990

<212> PRT

<213> Mycobacterium ulcerans

<220>

<223> Amino acid sequence of the protein encoded by mlsA1 gene.

<400> 7

Val	Ile	Phe	Gly	Asp	Ala	His	Gln	Asn	Cys	Arg	Gly	Arg	Val	Leu
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Gly	Asp	Ala	Val	Ala	Val	Val	Gly	Met	Ser	Cys	Arg	Val	Pro	Gly	Ala
								20	25				30		

Ser	Asp	Pro	Asp	Ala	Leu	Trp	Ala	Leu	Leu	Arg	Asp	Gly	Ile	Ser	Val
										35	40		45		

Val Asp Glu Ile Pro Ser Ala Arg Trp Asn Leu Asp Gly Leu Val Ala
50 55 60

His Arg Leu Thr Asp Glu Gln Arg Ser Ala Leu Arg His Gly Ala Phe
65 70 75 80

Leu Asp Asp Val Glu Gly Phe Asp Ala Ala Phe Phe Gly Ile Asn Pro
85 90 95

Ser Glu Ala Gly Ser Met Asp Pro Gln Gln Arg Leu Met Leu Glu Leu
100 105 110

Thr Trp Ala Ala Leu Glu Asp Ala Arg Ile Val Pro Glu His Leu Ser
115 120 125

Gly Ser Ser Ser Gly Val Phe Thr Gly Ala Met Ser Asp Asp Tyr Thr
130 135 140

Thr Ala Val Thr Tyr Arg Ala Ala Met Thr Ala His Thr Phe Ala Gly
145 150 155 160

Thr His Arg Ser Leu Ile Ala Asn Arg Val Ser Tyr Thr Leu Gly Leu
165 170 175

Arg Gly Pro Ser Leu Val Ile Asp Thr Gly Gln Ser Ser Ser Leu Val
180 185 190

Ala Val His Val Ala Met Glu Ser Leu Arg Arg Glu Glu Thr Ser Leu
195 200 205

Ala Ile Ala Gly Gly Ile His Leu Asn Leu Ser Leu Ala Ala Ala Leu
210 215 220

Ser Ala Ala His Phe Gly Ala Leu Ser Pro Asp Gly Arg Cys Tyr Thr
225 230 235 240

Phe Asp Ala Arg Ala Asn Gly Tyr Val Arg Gly Glu Gly Gly Val
245 250 255

Val Val Leu Lys Arg Leu Asn Asp Ala Leu Ala Asp Gly Asn His Ile
260 265 270

Tyr Cys Val Ile Arg Gly Ser Ser Val Asn Asn Asp Gly Ala Thr Gln
275 280 285

Asp Leu Thr Ala Pro Gly Val Asp Gly Gln Arg Gln Ala Leu Leu Gln
290 295 300

Ala Tyr Glu Arg Ala Glu Ile Asp Pro Ser Glu Val Gln Tyr Val Glu
305 310 315 320

Leu His Gly Thr Gly Thr Arg Leu Gly Asp Pro Thr Glu Ala His Ser
325 330 335

Leu His Ser Val Phe Gly Thr Ser Thr Val Pro Arg Ser Pro Leu Leu
340 345 350

Val Gly Ser Ile Lys Thr Asn Ile Gly His Leu Glu Gly Ala Ala Gly
355 360 365

Ile Leu Gly Leu Ile Lys Thr Ala Leu Ala Val His His Arg Gln Leu
370 375 380

Pro Pro Ser Leu Asn Tyr Thr Val Pro Asn Pro Lys Ile Pro Leu Glu
385 390 395 400

Gln Leu Gly Leu Arg Val Gln Thr Thr Leu Ser Glu Trp Pro Asp Leu
405 410 415

Asp Lys Pro Leu Thr Ala Gly Val Ser Ser Phe Ser Met Gly Gly Thr
420 425 430

Asn Ala His Leu Ile Leu Gln Gln Pro Pro Thr Pro Asp Thr Thr Gln
435 440 445

Thr Pro Asn Pro Thr Thr Gly Ser Asp Pro Ala Val Gly Ser Asp Pro
450 455 460

Ala Val Gly Val Leu Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly
465 470 475 480

Leu Ser Ala Gln Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro
485 490 495

Asp Leu Asp Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser
500 505 510

His His Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His Ser
515 520 525

Glu Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His Ala Leu
530 535 540

Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu Leu Thr Pro
545 550 555 560

Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly Gln Gly Ser Gln
565 570 575

Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln Phe Pro Val Phe Ala
580 585 590

His Ala Leu Asp Glu Val Ala Ala Ala Leu Asn Pro His Leu Asp Val
595 600 605

Ala Leu Leu Glu Val Met Phe Ser Gln Gln Asp Thr Ala Met Ala Gln
610 615 620

Leu Leu Asp Gln Thr Phe Tyr Ala Gln Pro Ala Leu Phe Ala Leu Gly
625 630 635 640

Thr Ala Leu His Arg Leu Phe Thr His Ala Gly Ile His Pro Asp Tyr
645 650 655

Leu Leu Gly His Ser Ile Gly Glu Leu Thr Ala Ala Tyr Ala Ala Gly
660 665 670

Val Leu Ser Leu Gln Asp Ala Ala Thr Leu Val Thr Ser Arg Gly Arg
675 680 685

Leu Met Gln Ser Cys Thr Pro Gly Gly Thr Met Leu Ala Leu Gln Ala
690 695 700

Ser Glu Ala Glu Val Gln Pro Leu Leu Glu Gly Leu Asp His Ala Val
705 710 715 720

Ser Ile Ala Ala Ile Asn Gly Ala Thr Ser Ile Val Leu Ser Gly Asp
725 730 735

His Asp Ser Leu Glu Gln Ile Gly Glu His Phe Ile Thr Gln Asp Arg
740 745 750

Arg Thr Thr Arg Leu Gln Val Ser His Ala Phe His Ser Pro His Met
755 760 765

Asp Pro Ile Leu Glu Gln Phe Arg Gln Ile Ala Ala Gln Leu Thr Phe

770 775 780

Ser Ala Pro Thr Leu Pro Ile Leu Ser Asn Leu Thr Gly Gln Ile Ala
785 790 795 800

Arg His Asp Gln Leu Ala Ser Pro Asp Tyr Trp Thr Gln Gln Leu Arg
805 810 815

Asn Thr Val Arg Phe His Asp Thr Val Ala Ala Leu Leu Gly Ala Gly
820 825 830

Glu Gln Val Phe Leu Glu Leu Ser Pro His Pro Val Leu Thr Gln Ala
835 840 845

Ile Thr Asp Thr Val Glu Gln Ala Gly Gly Gly Ala Ala Val Pro
850 855 860

Ala Leu Arg Lys Asp Arg Pro Asp Ala Val Ala Phe Ala Ala Ala Leu
865 870 875 880

Gly Gln Leu His Cys His Gly Ile Ser Pro Ser Trp Asn Val Leu Tyr
885 890 895

Cys Gln Ala Arg Pro Leu Thr Leu Pro Thr Tyr Ala Phe Gln His Gln
900 905 910

Arg Tyr Trp Leu Leu Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr
915 920 925

His Ala Met His Pro Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn
930 935 940

Arg Gly Trp Val Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp
945 950 955 960

Leu Asn Glu His Ala Val Glu Ser Ala Val Leu Phe Pro Asn Thr Gly
965 970 975

Phe Val Glu Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser
980 985 990

Val Asn Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly His Asp
995 1000 1005

Thr Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met Gly

1010 1015 1020

Arg Gln Ser Leu Asn Ile His Ser His Pro His Ile Gly His Asp
1025 1030 1035

Asn Thr Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His Ala
1040 1045 1050

Ser Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu Pro
1055 1060 1065

Leu Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile Glu
1070 1075 1080

Val Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn Tyr
1085 1090 1095

Gly Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His Ala
1100 1105 1110

Thr Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp Thr
1115 1120 1125

Asp Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala Ala
1130 1135 1140

Leu His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp Thr
1145 1150 1155

Asp Asp Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg Leu Pro
1160 1165 1170

Tyr Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr Arg
1175 1180 1185

Leu Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr Val
1190 1195 1200

His Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp Ser
1205 1210 1215

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Thr Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His Pro

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Asp Thr Thr Thr Asp Thr Asp Thr Asp Ala Leu Arg Tyr
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Gln Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu His
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Asp Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Thr Glu Ala
1280 1285 1290

Asp Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu Leu
1295 1300 1305

Gln Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile His
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Thr Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu Thr
1325 1330 1335

His Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg His
1340 1345 1350

Gly Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala His
1355 1360 1365

Ala Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His Pro
1370 1375 1380

Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser Asp
1385 1390 1395

Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln Leu
1400 1405 1410

Ala Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg His
1415 1420 1425

Ser Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp Pro Glu
1430 1435 1440

Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala Leu
1445 1450 1455

Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His Leu Leu

1460 1465 1470

Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp Leu
1475 1480 1485

Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr Ala
1490 1495 1500

Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn Ser
1505 1510 1515

Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala Ala
1520 1525 1530

Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln Leu
1535 1540 1545

Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu His
1550 1555 1560

Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe Ser
1565 1570 1575

Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr Ala
1580 1585 1590

Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His Arg
1595 1600 1605

Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln Thr
1610 1615 1620

His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala Arg
1625 1630 1635

Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly Leu
1640 1645 1650

Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser Ile
1655 1660 1665

Pro Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg Asp
1670 1675 1680

Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro Arg
1685 1690 1695

Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu Asn
1700 1705 1710

Gly Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr Leu Val
1715 1720 1725

Ala Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu Ser
1730 1735 1740

Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser Leu
1745 1750 1755

Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly Leu
1760 1765 1770

Asn Leu Ser Ser Thr Leu Ile Phe Asp His Pro Thr Pro His Ala
1775 1780 1785

Val Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile Gly Ala Leu
1790 1795 1800

Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu Glu Pro
1805 1810 1815

Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly Val Ala
1820 1825 1830

Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg Asp Val
1835 1840 1845

Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu
1850 1855 1860

Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr
1865 1870 1875

Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe
1880 1885 1890

Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg
1895 1900 1905

Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile
1910 1915 1920

Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Val Gly
1925 1930 1935

Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp Ala Glu
1940 1945 1950

Gly Tyr Ala Met Thr Gly Gly Ala Thr Ser Val Met Ser Gly Arg
1955 1960 1965

Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr Val Asp
1970 1975 1980

Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala Cys Gln
1985 1990 1995

Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly Val
2000 2005 2010

Thr Val Met Ser Thr Pro Ala Val Phe Thr Asp Phe Ser Arg Gln
2015 2020 2025

Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala Thr
2030 2035 2040

Ala Asp Gly Thr Gly Trp Gly Glu Gly Ala Ala Val Leu Val Leu
2045 2050 2055

Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val Leu Ala
2060 2065 2070

Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly
2075 2080 2085

Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn Gln
2090 2095 2100

Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala Val
2105 2110 2115

Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala
2120 2125 2130

Gly Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp Gln
2135 2140 2145

Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln
2150 2155 2160

Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile
2165 2170 2175

Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser
2180 2185 2190

Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr Glu
2195 2200 2205

Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala Val
2210 2215 2220

Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile Leu Gln
2225 2230 2235

Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn Pro Thr Thr
2240 2245 2250

Gly Ser Asp Pro Ala Val Gly Ser Asp Ser Ala Val Gly Ser Asp
2255 2260 2265

Pro Ala Val Gly Val Leu Val Trp Pro Leu Ser Ala Arg Ser Ala
2270 2275 2280

Pro Gly Leu Ser Ala Gln Ala Ala Arg Leu Tyr Gln His Leu Ser
2285 2290 2295

Ala His Pro Asp Leu Asp Pro Ile Asp Val Ala His Ser Leu Ala
2300 2305 2310

Thr Thr Arg Ser His His Pro His Arg Ala Thr Ile Thr Thr Ser
2315 2320 2325

Ile Glu His His Ser Glu Asn Asn His Asp Thr Thr Asp Ala Leu
2330 2335 2340

Ala Ala Leu His Ala Leu Ala Asn Asn Gly Thr His Pro Leu Leu
2345 2350 2355

Ser Arg Gly Leu Leu Thr Pro Gln Gly Pro Gly Lys Thr Val Phe
2360 2365 2370

Val Phe Pro Gly Gln Gly Ser Gln Tyr Pro Gly Met Gly Ala Asp
 2375 2380 2385

Leu Tyr Arg Gln Phe Pro Val Phe Ala His Ala Leu Asp Glu Val
 2390 2395 2400

Ala Ala Ala Leu Asn Pro His Leu Asp Val Ala Leu Leu Glu Val
 2405 2410 2415

Met Phe Ser Gln Gln Asp Thr Ala Met Ala Gln Leu Leu Asp Gln
 2420 2425 2430

Thr Phe Tyr Ala Gln Pro Ala Leu Phe Ala Leu Gly Thr Ala Leu
 2435 2440 2445

His Arg Leu Phe Thr His Ala Gly Ile His Pro Asp Tyr Leu Leu
 2450 2455 2460

Gly His Ser Ile Gly Glu Leu Thr Ala Ala Tyr Ala Ala Gly Val
 2465 2470 2475

Leu Ser Leu Gln Asp Ala Ala Thr Leu Val Thr Ser Arg Gly Arg
 2480 2485 2490

Leu Met Gln Ser Cys Thr Pro Gly Gly Thr Met Leu Ala Leu Gln
 2495 2500 2505

Ala Ser Glu Ala Glu Val Gln Pro Leu Leu Glu Gly Leu Asp His
 2510 2515 2520

Ala Val Ser Ile Ala Ala Ile Asn Gly Ala Thr Ser Ile Val Leu
 2525 2530 2535

Ser Gly Asp His Asp Ser Leu Glu Gln Ile Gly Glu His Phe Ile
 2540 2545 2550

Thr Gln Asp Arg Arg Thr Thr Arg Leu Gln Val Ser His Ala Phe
 2555 2560 2565

His Ser Pro His Met Asp Pro Ile Leu Glu Gln Phe Arg Gln Ile
 2570 2575 2580

Ala Ala Gln Leu Thr Phe Ser Ala Pro Thr Leu Pro Ile Leu Ser
 2585 2590 2595

Asn Leu Thr Gly Gln Ile Ala Arg His Asp Gln Leu Ala Ser Pro

2600 2605 2610

Asp Tyr Trp Thr Gln Gln Leu Arg Asn Thr Val Arg Phe His Asp
2615 2620 2625

Thr Val Ala Ala Leu Leu Gly Ala Gly Glu Gln Val Phe Leu Glu
2630 2635 2640

Leu Ser Pro His Pro Val Leu Thr Gln Ala Ile Thr Asp Thr Val
2645 2650 2655

Glu Gln Ala Gly Gly Gly Ala Ala Val Pro Ala Leu Arg Lys
2660 2665 2670

Asp Arg Pro Asp Ala Val Ala Phe Ala Ala Ala Leu Gly Gln Leu
2675 2680 2685

His Cys His Gly Ile Ser Pro Ser Trp Asn Val Leu Tyr Cys Gln
2690 2695 2700

Ala Arg Pro Leu Thr Leu Pro Thr Tyr Ala Phe Gln His Gln Arg
2705 2710 2715

Tyr Trp Leu Leu Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr
2720 2725 2730

His Ala Met His Pro Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu
2735 2740 2745

Asn Arg Gly Trp Val Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln
2750 2755 2760

Pro Trp Leu Asn Glu His Ala Val Glu Ser Ala Val Leu Phe Pro
2765 2770 2775

Asn Thr Gly Phe Val Glu Leu Ala Leu His Val Ala Asp Arg Ala
2780 2785 2790

Gly Tyr Ser Ser Val Asn Glu Leu Ile Val His Thr Pro Leu Leu
2795 2800 2805

Leu Ala Gly His Asp Thr Ala Asp Leu Gln Ile Thr Val Thr Asp
2810 2815 2820

Thr Asp Asp Met Gly Arg Gln Ser Leu Asn Ile His Ser Arg Pro
2825 2830 2835

His Ile Gly His Asp Asn Thr Thr Thr Gly Asp Glu Gln Pro Glu
2840 2845 2850

Trp Val Leu His Ala Ser Ala Val Leu Thr Ala Gln Thr Thr Asp
2855 2860 2865

His Asn His Leu Pro Leu Thr Pro Val Pro Trp Pro Pro Pro Gly
2870 2875 2880

Thr Ala Ala Ile Glu Val Asp Asp Phe Tyr Asp Asp Leu Ala Ala
2885 2890 2895

Gln Gly Tyr Asn Tyr Gly Pro Thr Phe Gln Gly Val Gln Arg Ile
2900 2905 2910

Trp Arg Asp His Ala Thr Pro Asp Val Ile Tyr Ala Glu Val Glu
2915 2920 2925

Leu Pro Glu Asp Thr Asp Ile Asp Gly Tyr Gly Ile His Pro Ala
2930 2935 2940

Leu Phe Asp Ala Ala Leu His Pro Leu Leu Ala Leu Thr Gln Pro
2945 2950 2955

Pro Thr Asn Asp Thr Asp Asp Thr Asn Thr Ala Asp Thr Gly Asp
2960 2965 2970

Gln Val Arg Leu Pro Tyr Ala Phe Thr Gly Ile Ser Leu His Ala
2975 2980 2985

Thr His Ala Thr Arg Leu Arg Val Arg Leu Thr Arg Thr Gly Ala
2990 2995 3000

Asp Ala Ile Thr Val His Thr Ser Asp Thr Thr Gly Ala Pro Val
3005 3010 3015

Ala Ile Ile Asp Ser Leu Ile Thr Arg Pro Leu Thr Thr Ala Thr
3020 3025 3030

Gly Ser Ala Pro Ala Thr Thr Ala Ala Gly Leu Leu His Leu Ser
3035 3040 3045

Trp Pro Pro His Pro Asp Thr Thr Thr Asp Thr Asp Thr Asp Thr
3050 3055 3060

Asp Ala Leu Arg Tyr Gln Val Ile Ala Glu Pro Thr Gln Gln Leu
3065 3070 3075

Pro Arg Tyr Leu His Asp Leu His Thr Ser Thr Asp Leu His Thr
3080 3085 3090

Ser Thr Thr Glu Ala Asp Val Val Val Trp Pro Val Pro Val Pro
3095 3100 3105

Ser Asn Glu Glu Leu Gln Ala His Gln Ala Ser Asp Thr Ala Val
3110 3115 3120

Ser Ser Arg Ile His Thr Leu Thr Arg Gln Thr Leu Thr Val Val
3125 3130 3135

Gln Asp Trp Leu Thr His Pro Asp Thr Thr Gly Thr Arg Leu Val
3140 3145 3150

Ile Val Thr Arg His Gly Val Ser Thr Ser Ala His Asp Pro Val
3155 3160 3165

Pro Asp Leu Ala His Ala Ala Val Trp Gly Leu Ile Arg Ser Ala
3170 3175 3180

Gln Asn Glu His Pro Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp
3185 3190 3195

Asn Thr Asn Ser Asp Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr
3200 3205 3210

Arg Glu Asn Gln Leu Ala Ile Arg Arg Asp Thr Ile His Ile Pro
3215 3220 3225

Arg Leu Thr Arg His Ser Ser Asp Gly Ala Leu Thr Ala Pro Val
3230 3235 3240

Val Val Asp Pro Glu Gly Thr Val Leu Ile Thr Gly Gly Thr Gly
3245 3250 3255

Thr Leu Gly Ala Leu Phe Ala Glu His Leu Val Ser Ala His Gly
3260 3265 3270

Val Arg His Leu Leu Leu Thr Ser Arg Arg Gly Pro Gln Ala His
3275 3280 3285

Gly Ala Thr Asp Leu Gln Gln Arg Leu Thr Asp Leu Gly Ala His
3290 3295 3300

Val Thr Ile Thr Ala Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala
3305 3310 3315

Ala Leu Val Asn Ser Val Pro Thr Gln His Arg Leu Thr Ala Val
3320 3325 3330

Val His Thr Ala Ala Val Leu Ala Asp Thr Pro Val Thr Glu Leu
3335 3340 3345

Thr Gly Asp Gln Leu Asp Gln Val Leu Ala Pro Lys Ile Asp Ala
3350 3355 3360

Ala Trp Gln Leu His Gln Leu Thr Tyr Glu His Asn Leu Ser Ala
3365 3370 3375

Phe Ile Met Phe Ser Ser Met Ala Gly Met Ile Gly Ser Pro Gly
3380 3385 3390

Gln Gly Asn Tyr Ala Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala
3395 3400 3405

Asp Tyr Arg His Arg Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp
3410 3415 3420

Gly Tyr Trp Gln Thr His Thr Gly Leu Thr Ala His Leu Thr Asp
3425 3430 3435

Val Asp Leu Ala Arg Met Thr Arg Leu Gly Leu Met Pro Ile Ala
3440 3445 3450

Thr Ser His Gly Leu Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly
3455 3460 3465

Gln Pro Val Ser Ile Pro Ala Pro Ile Asn Thr His Thr Leu Ala
3470 3475 3480

Arg His Ala Arg Asp Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu
3485 3490 3495

Ile Thr Thr Pro Arg Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu
3500 3505 3510

Ala Ala Arg Leu Asn Gly Leu Ser Pro Gln Gln Gln Gln Thr
3515 3520 3525

Leu Ala Thr Leu Val Ala Ala Ala Thr Ala Thr Val Leu Gly His
3530 3535 3540

His Thr Pro Glu Ser Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu
3545 3550 3555

Gly Ile Asp Ser Leu Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr
3560 3565 3570

His Asn Thr Gly Leu Asn Leu Ser Ser Thr Leu Ile Phe Asp His
3575 3580 3585

Pro Thr Pro His Ala Val Ala Glu His Leu Leu Glu Gln Ile Pro
3590 3595 3600

Gly Ile Gly Ala Leu Val Pro Ala Pro Val Val Ile Ala Ala Gly
3605 3610 3615

Arg Thr Glu Glu Pro Val Ala Val Val Gly Met Ala Cys Arg Phe
3620 3625 3630

Pro Gly Gly Val Ala Ser Ala Asp Gln Leu Trp Asp Leu Val Ile
3635 3640 3645

Ala Gly Arg Asp Val Val Gly Asn Phe Pro Ala Asp Arg Gly Trp
3650 3655 3660

Asp Val Glu Gly Leu Phe Asp Pro Asp Pro Asp Ala Val Gly Lys
3665 3670 3675

Thr Tyr Thr Arg Tyr Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe
3680 3685 3690

Asp Ala Gly Phe Phe Gly Ile Ser Pro Arg Glu Ala Arg Ala Met
3695 3700 3705

Asp Pro Gln Gln Arg Leu Leu Leu Glu Val Cys Trp Glu Ala Leu
3710 3715 3720

Glu Thr Ala Gly Ile Pro Ala His Thr Leu Ala Gly Thr Ser Thr
3725 3730 3735

Gly Val Phe Val Gly Ala Gly Ala Gln Ser Tyr Gly Ala Thr Asn
 3740 3745 3750

Ser Asp Asp Ala Glu Gly Tyr Ala Met Thr Gly Gly Ala Thr Ser
 3755 3760 3765

Val Met Ser Gly Arg Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro
 3770 3775 3780

Ala Ile Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Ile
 3785 3790 3795

His Leu Ala Cys Gln Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala
 3800 3805 3810

Leu Ala Gly Gly Val Thr Val Met Ser Thr Pro Ala Ile Phe Thr
 3815 3820 3825

Glu Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys
 3830 3835 3840

Ala Phe Ala Ala Thr Ala Asp Gly Thr Gly Trp Gly Glu Gly Ala
 3845 3850 3855

Ala Val Leu Val Leu Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn
 3860 3865 3870

His Pro Val Leu Ala Ile Val Ala Gly Ser Ala Ile Asn Gln Asp
 3875 3880 3885

Gly Ala Ser Asn Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln
 3890 3895 3900

Arg Val Ile Asn Gln Ala Leu Ala Asn Ala Gly Leu Thr His Asp
 3905 3910 3915

Gln Val Asp Ala Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly
 3920 3925 3930

Asp Pro Ile Glu Ala Gly Ala Leu His Ala Thr Tyr Gly His His
 3935 3940 3945

His Thr Pro Asp Gln Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn
 3950 3955 3960

Ile Gly His Thr Gln Ala Ala Ala Gly Ala Ala Gly Val Val Lys
 3965 3970 3975

Met Ile Gln Ala Ile Thr His Ala Thr Leu Pro Ala Thr Leu His
 3980 3985 3990

Val Asp Gln Pro Ser Pro His Ile Asp Trp Ser Ser Gly Thr Val
 3995 4000 4005

Arg Leu Leu Thr Glu Pro Ile Gln Trp Pro Asn Thr Asp His Pro
 4010 4015 4020

Arg Thr Ala Ala Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala
 4025 4030 4035

His Leu Ile Leu Gln Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr
 4040 4045 4050

Pro Asn Pro Thr Thr Gly Ser Asp Pro Ala Val Gly Ser Asp Ser
 4055 4060 4065

Ala Val Gly Ser Asp Pro Ala Val Gly Val Leu Val Trp Pro Leu
 4070 4075 4080

Ser Ala Arg Ser Ala Pro Gly Leu Ser Ala Gln Ala Ala Arg Leu
 4085 4090 4095

Tyr Gln His Leu Ser Ala His Pro Asp Leu Asp Pro Ile Asp Val
 4100 4105 4110

Ala His Ser Leu Ala Thr Thr Arg Ser His His Pro His Arg Ala
 4115 4120 4125

Thr Ile Thr Thr Ser Ile Glu His His Ser Glu Asn Asn His Asp
 4130 4135 4140

Thr Thr Asp Ala Leu Ala Ala Leu His Ala Leu Ala Asn Asn Gly
 4145 4150 4155

Thr His Pro Leu Leu Ser Arg Gly Leu Leu Thr Pro Gln Gly Pro
 4160 4165 4170

Gly Lys Thr Val Phe Val Phe Pro Gly Gln Gly Ser Gln Tyr Pro
 4175 4180 4185

Gly Met Gly Ala Asp Leu Tyr Arg Gln Phe Pro Val Phe Ala His

4190

4195

4200

Ala Leu Asp Ala Cys Asp Ala Ala Leu Gln Pro Phe Thr Gly Trp
4205 4210 4215

Ser Val Leu Ala Val Leu His Asp Glu Pro Glu Ala Pro Ser Leu
4220 4225 4230

Glu Arg Val Asp Val Val Gln Pro Val Leu Phe Ser Val Met Val
4235 4240 4245

Ser Leu Ala Ala Leu Trp Arg Trp Ala Gly Ile Thr Pro Asp Ala
4250 4255 4260

Val Ile Gly His Ser Gln Gly Glu Ile Ala Ala Ala His Val Ala
4265 4270 4275

Gly Ala Leu Thr Leu Pro Glu Ala Ala Ala Val Val Ala Leu Arg
4280 4285 4290

Ser Arg Val Leu Thr Asp Leu Ala Gly Ala Gly Ala Met Ala Ser
4295 4300 4305

Val Leu Ser Pro Glu Glu Pro Leu Thr Gln Leu Leu Ala Arg Trp
4310 4315 4320

Asp Gly Lys Ile Thr Val Ala Ala Val Asn Gly Pro Ala Ser Ala
4325 4330 4335

Val Val Ser Gly Asp Thr Thr Ala Ile Thr Glu Leu Leu Ile Thr
4340 4345 4350

Cys Glu His Glu Asn Ile Asp Ala Arg Ala Ile Pro Val Asp Tyr
4355 4360 4365

Pro Ser His Ser Pro Tyr Met Glu His Ile Arg His Gln Phe Leu
4370 4375 4380

Asp Glu Leu Pro Glu Leu Thr Pro Arg Pro Ser Thr Ile Ala Met
4385 4390 4395

Tyr Ser Thr Val Asp Gly Glu Pro His Asp Thr Ala Tyr Asp Thr
4400 4405 4410

Thr Thr Met Thr Ala Asp Tyr Trp Tyr Arg Asn Ile Arg Asn Thr
4415 4420 4425

Val Arg Phe His Asp Thr Val Ala Ala Leu Leu Gly Ala Gly Glu
4430 4435 4440

Gln Val Phe Leu Glu Leu Ser Pro His Pro Val Leu Thr Gln Ala
4445 4450 4455

Ile Thr Asp Thr Val Glu Gln Ala Gly Gly Gly Ala Ala Val
4460 4465 4470

Pro Ala Leu Arg Lys Asp Arg Pro Asp Ala Val Ala Phe Ala Ala
4475 4480 4485

Ala Leu Gly Gln Leu His Cys His Gly Ile Ser Pro Ser Trp Asn
4490 4495 4500

Val Leu Tyr Cys Gln Ala Arg Pro Leu Thr Leu Pro Thr Tyr Ala
4505 4510 4515

Phe Gln His Gln Arg Tyr Trp Leu Leu Pro Thr Ala Gly Asp Phe
4520 4525 4530

Ser Gly Ala Asn Thr His Ala Met His Pro Leu Leu Asp Thr Ala
4535 4540 4545

Thr Glu Leu Ala Glu Asn Arg Gly Trp Val Phe Thr Gly Arg Ile
4550 4555 4560

Ser Pro Arg Thr Gln Pro Trp Leu Asn Glu His Ala Val Glu Ser
4565 4570 4575

Ala Val Leu Phe Pro Gly Thr Gly Phe Val Glu Leu Ala Leu His
4580 4585 4590

Val Ala Asp Arg Ala Gly Tyr Ser Ser Val Asn Glu Leu Ile Val
4595 4600 4605

His Thr Pro Leu Leu Ala Gly His Asp Thr Ala Asp Leu Gln
4610 4615 4620

Ile Thr Val Thr Asp Thr Asp Asp Met Gly Arg Gln Ser Leu Asn
4625 4630 4635

Ile His Ser Arg Pro His Ile Gly His Asp Asn Thr Thr Thr Gly
4640 4645 4650

Asp Glu Gln Pro Glu Trp Val Leu His Ala Ser Ala Val Leu Thr
4655 4660 4665

Ala Gln Thr Thr Asp His Asn His Leu Pro Leu Thr Pro Val Pro
4670 4675 4680

Trp Pro Pro Pro Gly Thr Ala Ala Ile Glu Val Asp Asp Phe Tyr
4685 4690 4695

Asp Asp Leu Ala Ala Gln Gly Tyr Asn Tyr Gly Pro Thr Phe Gln
4700 4705 4710

Gly Val Gln Arg Ile Trp Arg Asp His Ala Thr Pro Asp Val Ile
4715 4720 4725

Tyr Ala Glu Val Glu Leu Pro Glu Asp Thr Asp Ile Asp Gly Tyr
4730 4735 4740

Gly Ile His Pro Ala Leu Phe Asp Ala Ala Leu His Pro Leu Leu
4745 4750 4755

Ala Leu Thr Gln Pro Pro Thr Asn Asp Thr Asp Asp Thr Asn Thr
4760 4765 4770

Ala Asp Thr Gly Asp Gln Val Arg Leu Pro Tyr Ala Phe Thr Gly
4775 4780 4785

Ile Ser Leu His Ala Thr His Ala Thr Arg Leu Arg Val Arg Leu
4790 4795 4800

Thr Arg Thr Gly Ala Asp Ala Ile Thr Val His Thr Ser Asp Thr
4805 4810 4815

Thr Gly Ala Pro Val Ala Ile Ile Asp Ser Leu Ile Thr Arg Pro
4820 4825 4830

Leu Thr Thr Ala Thr Gly Ser Ala Pro Ala Thr Thr Ala Ala Gly
4835 4840 4845

Leu Leu His Leu Ser Trp Pro Pro His Pro Asp Thr Thr Thr Asp
4850 4855 4860

Thr Asp Thr Asp Thr Asp Ala Leu Arg Tyr Gln Val Ile Ala Glu
4865 4870 4875

Pro Thr Gln Gln Leu Pro Arg Tyr Leu His Asp Leu His Thr Ser
4880 4885 4890

Thr Asp Leu His Thr Ser Thr Glu Ala Asp Val Val Val Trp
4895 4900 4905

Pro Val Pro Val Pro Ser Asn Glu Glu Leu Gln Ala His Gln Ala
4910 4915 4920

Ser Asp Thr Ala Val Ser Ser Arg Ile His Thr Leu Thr Arg Gln
4925 4930 4935

Thr Leu Thr Val Val Gln Asp Trp Leu Thr His Pro Asp Thr Thr
4940 4945 4950

Gly Thr Arg Leu Val Ile Val Thr Arg His Gly Val Ser Thr Ser
4955 4960 4965

Ala His Asp Pro Val Pro Asp Leu Ala His Ala Ala Val Trp Gly
4970 4975 4980

Leu Ile Arg Ser Ala Gln Asn Glu His Pro Gly Arg Phe Thr Leu
4985 4990 4995

Leu Asp Thr Asp Asp Asn Thr Asn Ser Asp Thr Leu Thr Thr Ala
5000 5005 5010

Leu Thr Leu Pro Thr Arg Glu Asn Gln Leu Ala Ile Arg Arg Asp
5015 5020 5025

Thr Ile His Ile Pro Arg Leu Thr Arg Thr Ala Val Leu Thr Pro
5030 5035 5040

Pro Asp Ser Gly Pro Trp Arg Leu Asp Thr Thr Gly Lys Gly Asp
5045 5050 5055

Leu Ala Asn Leu Ala Leu Leu Pro Thr Ala His Thr Ala Leu Ala
5060 5065 5070

Ser Gly Gln Ile Arg Ile Asp Val Arg Ala Ala Gly Leu Asn Phe
5075 5080 5085

His Asp Val Val Val Ala Leu Gly Leu Ile Pro Asp Asp Gly Phe
5090 5095 5100

Gly Gly Glu Ala Ala Gly Val Ile Ser Glu Ile Gly Pro Asp Val
5105 5110 5115

Tyr Gly Phe Ala Val Gly Asp Ala Val Thr Gly Met Thr Val Ser
5120 5125 5130

Gly Ala Phe Ala Pro Ser Thr Val Ala Asp His Arg Met Val Met
5135 5140 5145

Thr Ile Pro Ala Arg Trp Ser Phe Pro Gln Ala Ala Ser Ile Pro
5150 5155 5160

Val Val Phe Leu Thr Ala Tyr Ile Ala Leu Ala Glu Ile Ser Gly
5165 5170 5175

Leu Ser Arg Gly Gln Arg Val Leu Ile His Ala Gly Thr Gly Gly
5180 5185 5190

Val Gly Met Ala Ala Ile Gln Leu Ala His His Leu Gly Ala Glu
5195 5200 5205

Val Phe Ala Thr Ala Ser Ala Ala Lys Trp Ser Thr Leu Glu Ala
5210 5215 5220

Leu Gly Val Pro Arg Asp His Ile Ala Ser Ser Arg Thr Leu Asp
5225 5230 5235

Phe Ser Asn Ala Phe Leu Asp Ala Thr Asn Gly Ala Gly Val Asp
5240 5245 5250

Val Val Leu Asn Cys Leu Ser Gly Glu Phe Val Glu Ala Ser Leu
5255 5260 5265

Ala Leu Leu Pro Arg Gly Gly His Phe Val Glu Ile Gly Lys Thr
5270 5275 5280

Asp Ile Arg Asp Thr Glu Val Ile Ala Ala Thr His Pro Gly Val
5285 5290 5295

Ile Tyr Arg Ala Leu Asp Leu Leu Ser Val Ser Pro Asp His Ile
5300 5305 5310

Gln Arg Thr Leu Ala Gln Leu Ser Pro Leu Phe Ala Thr Asp Thr
5315 5320 5325

Leu Lys Pro Leu Pro Thr Thr Asn Tyr Ser Ile Tyr Gln Ala Ile
5330 5335 5340

Ser Ala Leu Arg Asp Met Ser Gln Ala Arg His Thr Gly Lys Ile
5345 5350 5355

Val Leu Thr Ala Pro Val Val Val Asp Pro Glu Gly Thr Val Leu
5360 5365 5370

Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala Leu Phe Ala Glu His
5375 5380 5385

Leu Val Ser Ala His Gly Val Arg His Leu Leu Leu Thr Ser Arg
5390 5395 5400

Arg Gly Pro Gln Ala His Gly Ala Thr Asp Leu Gln Gln Arg Leu
5405 5410 5415

Thr Asp Leu Gly Ala His Val Thr Ile Thr Ala Cys Asp Ile Ser
5420 5425 5430

Asp Pro Glu Ala Leu Ala Ala Leu Val Asn Ser Val Pro Thr Gln
5435 5440 5445

His Arg Leu Thr Ala Val Val His Thr Ala Val Val Leu Ala Asp
5450 5455 5460

Thr Pro Val Thr Glu Leu Thr Gly Asp Gln Leu Asp Gln Val Leu
5465 5470 5475

Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu His Gln Leu Thr Tyr
5480 5485 5490

Glu His Asn Leu Ser Ala Phe Ile Met Phe Ser Ser Met Ala Gly
5495 5500 5505

Met Ile Gly Ser Pro Gly Leu Gly Asn Tyr Ala Ala Ala Asn Thr
5510 5515 5520

Ala Leu Asp Ala Leu Ala Asp Tyr Arg His Arg Leu Gly Leu Pro
5525 5530 5535

Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln Thr Arg Thr Gly Leu
5540 5545 5550

Thr Ala His Leu Thr Asp Val Asp Leu Ala Arg Met Thr Arg Leu

5555	5560	5565
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Gly Leu Met Pro Ile Ala Thr Ser His Gly Leu Ala Leu Phe Asp		
5570	5575	5580

Ala Ala Leu Ala Thr Gly Gln Pro Val Ser Ile Pro Ala Pro Ile		
5585	5590	5595

Asn Thr His Thr Leu Ala Arg His Ala Arg Asp Asn Thr Leu Ala		
5600	5605	5610

Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro Arg Arg Arg Ala Ala		
5615	5620	5625

Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu Asn Gly Leu Ser Pro		
5630	5635	5640

Gln Gln Gln Gln Gln Thr Leu Ala Thr Leu Val Ala Ala Ala Thr		
5645	5650	5655

Ala Thr Val Leu Gly His His Thr Pro Glu Ser Ile Ser Pro Ala		
5660	5665	5670

Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser Leu Thr Ala Leu Glu		
5675	5680	5685

Leu Arg Asn Thr Leu Thr His Asn Thr Gly Leu Asn Leu Ser Ser		
5690	5695	5700

Thr Leu Ile Phe Asp His Pro Thr Pro His Ala Val Ala Glu His		
5705	5710	5715

Leu Leu Glu Gln Ile Pro Gly Ile Gly Ala Leu Val Pro Ala Pro		
5720	5725	5730

Val Val Ile Ala Ala Gly Arg Thr Glu Glu Pro Val Ala Val Val		
5735	5740	5745

Gly Met Ala Cys Arg Phe Pro Gly Gly Val Ala Ser Ala Asp Gln		
5750	5755	5760

Leu Trp Asp Leu Val Ile Ala Gly Arg Asp Val Val Gly Asn Phe		
5765	5770	5775

Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu Phe Asp Pro Asp	
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5780 5785 5790

Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr Gly Ala Phe Leu
5795 5800 5805

Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe Gly Ile Ser Pro
5810 5815 5820

Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu
5825 5830 5835

Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile Pro Ala His Thr
5840 5845 5850

Leu Ala Gly Thr Ser Thr Gly Val Phe Val Gly Ala Gly Ala Gln
5855 5860 5865

Ser Tyr Gly Ala Thr Asn Ser Asp Gly Ala Glu Gly Tyr Ala Met
5870 5875 5880

Thr Gly Gly Ala Ile Ser Val Met Ser Gly Arg Ile Ala Tyr Thr
5885 5890 5895

Leu Gly Leu Glu Gly Pro Ala Ile Thr Val Asp Thr Ala Cys Ser
5900 5905 5910.

Ser Ser Leu Val Ala Ile His Leu Ala Cys Gln Ser Leu Arg Asn
5915 5920 5925

Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly Val Thr Val Met Ser
5930 5935 5940

Thr Pro Ala Ile Phe Thr Glu Phe Ser Arg Gln Arg Gly Leu Ala
5945 5950 5955

Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala Thr Ala Asp Gly Thr
5960 5965 5970

Gly Phe Gly Glu Gly Ala Ala Val Leu Val Leu Glu Arg Leu Ser
5975 5980 5985

Glu Ala Arg Arg Asn Asn His Pro Val Leu Ala Ile Val Ala Gly
5990 5995 6000

Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro
6005 6010 6015

His Gly Pro Ser Gln Gln Arg Val Ile Asn Gln Ala Leu Ala Asn
6020 6025 6030

Ala Gly Leu Thr His Asp Gln Val Asp Ala Val Glu Ala His Gly
6035 6040 6045

Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala Ser Ala Leu His
6050 6055 6060

Ala Thr Tyr Gly His His Thr Pro Asp Gln Pro Leu Trp Leu
6065 6070 6075

Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala Gly
6080 6085 6090

Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile Thr His Ala Thr
6095 6100 6105

Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser Pro His Ile Asp
6110 6115 6120

Trp Ser Ser Gly Thr Val Arg Leu Leu Thr Glu Pro Ile Gln Trp
6125 6130 6135

Pro Asn Thr Asp His Pro Arg Thr Ala Ala Val Ser Ser Phe Gly
6140 6145 6150

Ile Ser Gly Thr Asn Ala His Leu Ile Leu Gln Gln Pro Pro Thr
6155 6160 6165

Pro Asp Thr Thr Gln Thr Pro Asn Thr Thr Gly Ser Asp Pro
6170 6175 6180

Ala Val Gly Ser Asp Ser Ala Val Gly Ser Asp Pro Ala Val Gly
6185 6190 6195

Val Leu Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu Ser
6200 6205 6210

Ala Gln Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro Asp
6215 6220 6225

Leu Asp Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser
6230 6235 6240

His His Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His
6245 6250 6255

Ser Glu Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His
6260 6265 6270

Ala Leu Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu
6275 6280 6285

Leu Thr Pro Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly
6290 6295 6300

Gln Gly Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln
6305 6310 6315

Phe Pro Val Phe Ala His Ala Leu Asp Ala Cys Asp Ala Ala Leu
6320 6325 6330

Gln Pro Phe Thr Gly Trp Ser Val Leu Ala Val Leu His Asp Glu
6335 6340 6345

Pro Glu Ala Pro Ser Leu Glu Arg Val Asp Val Val Gln Pro Val
6350 6355 6360

Leu Phe Ser Val Met Val Ser Leu Ala Ala Leu Trp Arg Trp Ala
6365 6370 6375

Gly Ile Thr Pro Asp Ala Val Ile Gly His Ser Gln Gly Glu Ile
6380 6385 6390

Ala Ala Ala His Val Ala Gly Ala Leu Thr Leu Pro Glu Ala Ala
6395 6400 6405

Ala Val Val Ala Leu Arg Ser Arg Val Leu Thr Asp Leu Ala Gly
6410 6415 6420

Ala Gly Ala Met Ala Ser Val Leu Ser Pro Glu Glu Pro Leu Thr
6425 6430 6435

Gln Leu Leu Ala Arg Trp Asp Gly Lys Ile Thr Val Ala Ala Val
6440 6445 6450

Asn Gly Pro Ala Ser Ala Val Val Ser Gly Asp Thr Thr Ala Ile
6455 6460 6465

Thr Glu Leu Leu Ile Thr Cys Glu His Glu Asn Ile Asp Ala Arg
 6470 6475 6480

Ala Ile Pro Val Asp Tyr Pro Ser His Ser Pro Tyr Met Glu His
 6485 6490 6495

Ile Arg His Gln Phe Leu Asp Glu Leu Pro Glu Leu Thr Pro Arg
 6500 6505 6510

Pro Ser Thr Ile Ala Met Tyr Ser Thr Val Asp Gly Glu Pro His
 6515 6520 6525

Asp Thr Ala Tyr Asp Thr Thr Thr Met Thr Ala Asp Tyr Trp Tyr
 6530 6535 6540

Arg Asn Ile Arg Asn Thr Val Arg Phe His Asp Thr Val Ala Ala
 6545 6550 6555

Leu Leu Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro His
 6560 6565 6570

Pro Val Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly
 6575 6580 6585

Gly Gly Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp
 6590 6595 6600

Ala Val Ala Phe Ala Ala Ala Leu Gly Gln Leu His Cys His Gly
 6605 6610 6615

Ile Ser Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu
 6620 6625 6630

Thr Leu Pro Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu
 6635 6640 6645

Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met His
 6650 6655 6660

Pro Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp
 6665 6670 6675

Val Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu Asn
 6680 6685 6690

Glu His Ala Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly Phe

6695 6700 6705

Val Glu Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser
6710 6715 6720

Val Asn Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly His
6725 6730 6735

Asp Thr Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met
6740 6745 6750

Gly Arg Gln Ser Leu Asn Ile His Ser Arg Pro His Ile Gly His
6755 6760 6765

Asp Asn Thr Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His
6770 6775 6780

Ala Ser Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu
6785 6790 6795

Pro Leu Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile
6800 6805 6810

Glu Val Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn
6815 6820 6825

Tyr Gly Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His
6830 6835 6840

Ala Thr Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp
6845 6850 6855

Thr Asp Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala
6860 6865 6870

Ala Leu His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp
6875 6880 6885

Thr Asp Asp Thr Asn Thr Ala Asp Thr Gly Asp Gin Val Arg Leu
6890 6895 6900

Pro Tyr Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr
6905 6910 6915

Arg Leu Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr

6920

6925

6930

Val His Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp
 6935 6940 6945

Ser Leu Ile Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala Pro
 6950 6955 6960

Ala Thr Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His
 6965 6970 6975

Pro Asp Thr Thr Asp Thr Asp Thr Asp Ala Leu Arg
 6980 6985 6990

Tyr Arg Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu
 6995 7000 7005

His Asp Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Thr Glu
 7010 7015 7020

Ala Asp Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu
 7025 7030 7035

Leu Gln Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile
 7040 7045 7050

His Thr Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu
 7055 7060 7065

Thr His Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg
 7070 7075 7080

His Gly Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala
 7085 7090 7095

His Ala Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His
 7100 7105 7110

Pro Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser
 7115 7120 7125

Asp Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln
 7130 7135 7140

Leu Ala Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg
 7145 7150 7155

His Ser Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp Pro
7160 7165 7170

Glu Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala
7175 7180 7185

Leu Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His Leu
7190 7195 7200

Leu Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp
7205 7210 7215

Leu Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr
7220 7225 7230

Ala Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn
7235 7240 7245

Ser Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala
7250 7255 7260

Ala Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln
7265 7270 7275

Leu Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu
7280 7285 7290

His Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe
7295 7300 7305

Ser Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr
7310 7315 7320

Ala Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His
7325 7330 7335

Arg Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln
7340 7345 7350

Thr His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala
7355 7360 7365

Arg Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly
7370 7375 7380

Leu Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser
7385 7390 7395

Ile Pro Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg
7400 7405 7410

Asp Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro
7415 7420 7425

Arg Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu
7430 7435 7440

Asn Gly Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr Leu
7445 7450 7455

Val Ala Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu
7460 7465 7470

Ser Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser
7475 7480 7485

Leu Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly
7490 7495 7500

Leu Asp Leu Pro Pro Thr Leu Ile Phe Asp His Pro Thr Pro Thr
7505 7510 7515

Ala Leu Thr Gln His Leu His Thr Arg Leu Thr Thr Gly Ala Leu
7520 7525 7530

Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu Glu Pro
7535 7540 7545

Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly Val Ala
7550 7555 7560

Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg Asp Val
7565 7570 7575

Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu
7580 7585 7590

Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr
7595 7600 7605

Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe
7610 7615 7620

Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg
7625 7630 7635

Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile
7640 7645 7650

Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Val Gly
7655 7660 7665

Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp Ala Glu
7670 7675 7680

Gly Tyr Ala Met Thr Gly Gly Ala Ile Ser Val Met Ser Gly Arg
7685 7690 7695

Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr Val Asp
7700 7705 7710

Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala Cys Gln
7715 7720 7725

Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly Val
7730 7735 7740

Thr Val Met Ser Thr Pro Ala Val Phe Thr Asp Phe Ser Arg Gln
7745 7750 7755

Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala Thr
7760 7765 7770

Ala Asp Gly Thr Gly Phe Gly Glu Gly Ala Ala Val Leu Val Leu
7775 7780 7785

Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val Leu Ala
7790 7795 7800

Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly
7805 7810 7815

Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn Gln
7820 7825 7830

Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala Val
7835 7840 7845

Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala
7850 7855 7860

Gly Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp Gln
7865 7870 7875

Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln
7880 7885 7890

Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile
7895 7900 7905

Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser
7910 7915 7920

Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr Glu
7925 7930 7935

Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala Val
7940 7945 7950

Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile Leu Gln
7955 7960 7965

Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn Thr Thr Thr
7970 7975 7980

Gly Ser Asp Pro Ala Val Gly Ser Asp Pro Ala Val Gly Val Leu
7985 7990 7995

Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu Ser Ala Gln
8000 8005 8010

Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro Asp Leu Asp
8015 8020 8025

Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser His His
8030 8035 8040

Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His Ser Glu
8045 8050 8055

Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His Ala Leu
 8060 8065 8070

Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu Leu Thr
 8075 8080 8085

Pro Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly Gln Gly
 8090 8095 8100

Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln Phe Pro
 8105 8110 8115

Val Phe Ala His Ala Leu Asp Ala Cys Asp Ala Ala Leu Gln Pro
 8120 8125 8130

Phe Thr Gly Trp Ser Val Leu Ala Val Leu His Asp Glu Pro Glu
 8135 8140 8145

Ala Pro Ser Leu Glu Arg Val Asp Val Val Gln Pro Val Leu Phe
 8150 8155 8160

Ser Val Met Val Ser Leu Ala Ala Leu Trp Arg Trp Ala Gly Ile
 8165 8170 8175

Thr Pro Asp Ala Val Ile Gly His Ser Gln Gly Glu Ile Ala Ala
 8180 8185 8190

Ala His Val Ala Gly Ala Leu Thr Leu Pro Glu Ala Ala Ala Val
 8195 8200 8205

Val Ala Leu Arg Ser Arg Val Leu Thr Asp Leu Ala Gly Ala Gly
 8210 8215 8220

Ala Met Ala Ser Val Leu Ser Pro Glu Glu Pro Leu Thr Gln Leu
 8225 8230 8235

Leu Ala Arg Trp Asp Gly Lys Ile Thr Val Ala Ala Val Asn Gly
 8240 8245 8250

Pro Ala Ser Ala Val Val Ser Gly Asp Thr Thr Ala Ile Thr Glu
 8255 8260 8265

Leu Leu Ile Thr Cys Glu His Glu Asn Ile Asp Ala Arg Ala Ile
 8270 8275 8280

Pro Val Asp Tyr Pro Ser His Ser Pro Tyr Met Glu His Ile Arg

8285 8290 8295

His Gln Phe Leu Asp Glu Leu Pro Glu Leu Thr Pro Arg Pro Ser
8300 8305 8310

Thr Ile Ala Met Tyr Ser Thr Val Asp Gly Glu Pro His Asp Thr
8315 8320 8325

Ala Tyr Asp Thr Thr Thr Met Thr Ala Asp Tyr Trp Tyr Arg Asn
8330 8335 8340

Ile Arg Asn Thr Val Arg Phe His Asp Thr Val Ala Ala Leu Leu
8345 8350 8355

Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro His Pro Val
8360 8365 8370

Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly Gly Gly
8375 8380 8385

Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp Ala Val
8390 8395 8400

Ala Phe Ala Ala Ala Leu Gly Gln Leu His Cys His Gly Ile Ser
8405 8410 8415

Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu Thr Leu
8420 8425 8430

Pro Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu Pro Thr
8435 8440 8445

Ala Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met His Pro Leu
8450 8455 8460

Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp Val Phe
8465 8470 8475

Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu Asn Glu His
8480 8485 8490

Ala Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly Phe Val Glu
8495 8500 8505

Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser Val Asn
8510 8515 8520

Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly His Asp Thr
8525 8530 8535

Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met Gly Arg
8540 8545 8550

Gln Ser Leu Asn Ile His Ser His Pro His Ile Gly His Asp Asn
8555 8560 8565

Thr Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His Ala Ser
8570 8575 8580

Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu Pro Leu
8585 8590 8595

Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile Glu Val
8600 8605 8610

Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn Tyr Gly
8615 8620 8625

Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His Ala Thr
8630 8635 8640

Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp Thr Asp
8645 8650 8655

Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala Ala Leu
8660 8665 8670

His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp Thr Asp
8675 8680 8685

Asp Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg Leu Pro Tyr
8690 8695 8700

Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr Arg Leu
8705 8710 8715

Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr Val His
8720 8725 8730

Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp Ser Leu
8735 8740 8745

Ile Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala Pro Ala Thr
8750 8755 8760

Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His Pro Asp
8765 8770 8775

Thr Thr Thr Asp Thr Asp Thr Asp Thr Asp Ala Leu Arg Tyr Gln
8780 8785 8790

Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu His Asp
8795 8800 8805

Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Thr Glu Ala Asp
8810 8815 8820

Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu Leu Gln
8825 8830 8835

Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile His Thr
8840 8845 8850

Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu Thr His
8855 8860 8865

Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg His Gly
8870 8875 8880

Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala His Ala
8885 8890 8895

Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His Pro Gly
8900 8905 8910

Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser Asp Thr
8915 8920 8925

Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln Leu Ala
8930 8935 8940

Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg Thr Ala
8945 8950 8955

Val Leu Thr Pro Pro Asp Ser Gly Pro Trp Arg Leu Asp Thr Thr
8960 8965 8970

Gly Lys Gly Asp Leu Ala Asn Leu Ala Leu Leu Pro Thr Ala His
8975 8980 8985

Thr Ala Leu Ala Ser Gly Gln Ile Arg Ile Asp Val Arg Ala Ala
8990 8995 9000

Gly Leu Asn Phe His Asp Val Val Val Ala Leu Gly Leu Ile Pro
9005 9010 9015

Asp Asp Gly Phe Gly Gly Glu Ala Ala Gly Val Ile Ser Glu Ile
9020 9025 9030

Gly Pro Asp Val Tyr Gly Phe Ala Val Gly Asp Ala Val Thr Gly
9035 9040 9045

Met Thr Val Ser Gly Ala Phe Ala Pro Ser Thr Val Ala Asp His
9050 9055 9060

Arg Met Val Met Thr Ile Pro Ala Arg Trp Ser Phe Pro Gln Ala
9065 9070 9075

Ala Ser Ile Pro Val Val Phe Leu Thr Ala Tyr Ile Ala Leu Ala
9080 9085 9090

Glu Ile Ser Gly Leu Ser Arg Gly Gln Arg Val Leu Ile His Ala
9095 9100 9105

Gly Thr Gly Gly Val Gly Met Ala Ala Ile Gln Leu Ala His His
9110 9115 9120

Leu Gly Ala Glu Val Phe Ala Thr Ala Ser Ala Ala Lys Trp Ser
9125 9130 9135

Thr Leu Glu Ala Leu Gly Val Pro Arg Asp His Ile Ala Ser Ser
9140 9145 9150

Arg Thr Leu Asp Phe Ser Asn Ala Phe Leu Asp Ala Thr Asn Gly
9155 9160 9165

Ala Gly Val Asp Val Val Leu Asn Cys Leu Ser Gly Glu Phe Val
9170 9175 9180

Glu Ala Ser Leu Ala Leu Leu Pro Arg Gly Gly His Phe Val Glu
9185 9190 9195

Ile Gly Lys Thr Asp Ile Arg Asp Thr Glu Val Ile Ala Ala Thr
9200 9205 9210

His Pro Gly Val Ile Tyr Arg Ala Leu Asp Leu Leu Ser Val Ser
9215 9220 9225

Pro Asp His Ile Gln Arg Thr Leu Ala Gln Leu Ser Pro Leu Phe
9230 9235 9240

Ala Thr Asp Thr Leu Lys Pro Leu Pro Thr Thr Asn Tyr Ser Ile
9245 9250 9255

Tyr Gln Ala Ile Ser Ala Leu Arg Asp Met Ser Gln Ala Arg His
9260 9265 9270

Thr Gly Lys Ile Val Leu Thr Ala Pro Val Val Val Asp Pro Glu
9275 9280 9285

Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala Leu
9290 9295 9300

Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His Leu Leu
9305 9310 9315

Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp Leu
9320 9325 9330

Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr Ala
9335 9340 9345

Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn Ser
9350 9355 9360

Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala Ala
9365 9370 9375

Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln Leu
9380 9385 9390

Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu His
9395 9400 9405

Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe Ser
9410 9415 9420

Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr Ala
9425 9430 9435

Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His Arg
9440 9445 9450

Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln Thr
9455 9460 9465

His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala Arg
9470 9475 9480

Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly Leu
9485 9490 9495

Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser Ile
9500 9505 9510

Pro Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg Asp
9515 9520 9525

Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro Arg
9530 9535 9540

Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu Asn
9545 9550 9555

Gly Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr Leu Val
9560 9565 9570

Ala Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu Ser
9575 9580 9585

Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser Leu
9590 9595 9600

Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly Leu
9605 9610 9615

Asn Leu Ser Ser Thr Leu Ile Phe Asp His Pro Thr Pro His Ala
9620 9625 9630

Val Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile Gly Ala Leu
9635 9640 9645

Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu Glu Pro
 9650 9655 9660

Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly Val Ala
 9665 9670 9675

Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg Asp Val
 9680 9685 9690

Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu
 9695 9700 9705

Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr
 9710 9715 9720

Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe
 9725 9730 9735

Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg
 9740 9745 9750

Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile
 9755 9760 9765

Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Val Gly
 9770 9775 9780

Ala Gly Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp Ala Glu
 9785 9790 9795

Gly Tyr Ala Met Thr Gly Gly Ala Thr Ser Val Met Ser Gly Arg
 9800 9805 9810

Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr Val Asp
 9815 9820 9825

Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala Cys Gln
 9830 9835 9840

Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly Val
 9845 9850 9855

Thr Val Met Ser Thr Pro Ala Val Phe Thr Glu Phe Ser Arg Gln
 9860 9865 9870

Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala Thr

9875 9880 9885

Ala Asp Gly Thr Gly Phe Gly Glu Gly Ala Ala Val Leu Val Leu
9890 9895 9900

Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val Leu Ala
9905 9910 9915

Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly
9920 9925 9930

Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn Gln
9935 9940 9945

Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala Val
9950 9955 9960

Glu Ala His Gly Thr Gly Thr Leu Gly Asp Pro Ile Glu Ala
9965 9970 9975

Gly Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp Gln
9980 9985 9990

Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln
9995 10000 10005

Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile
10010 10015 10020

Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser
10025 10030 10035

Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr Glu
10040 10045 10050

Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala Val
10055 10060 10065

Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile Leu Gln
10070 10075 10080

Gln Pro Pro Thr Pro Asn Pro Thr Gln Thr Pro Glu Asp Cys Ser
10085 10090 10095

Pro Ala Gln Ser Pro Cys Ala Thr Ile Thr Asp Ala Gly Thr Gly
10100 10105 10110

Leu Ser Phe Val Pro Trp Val Ile Ser Ala Lys Ser Ala Glu Ala
 10115 10120 10125

Leu Ser Ala Gln Ala Ser Arg Leu Leu Thr Arg Leu Asp Asp Asp
 10130 10135 10140

Pro Val Val Asp Ala Ile Asp Leu Gly Trp Ser Leu Ile Ala Thr
 10145 10150 10155

Arg Ser Met Phe Glu His Arg Ala Val Val Val Gly Ala Asp Arg
 10160 10165 10170

His Gln Leu Gln Arg Gly Leu Ala Glu Leu Ala Ser Gly Asn Leu
 10175 10180 10185

Gly Ala Asp Val Val Val Gly Arg Ala Arg Ala Ala Gly Glu Thr
 10190 10195 10200

Val Met Val Phe Pro Gly Gln Gly Ser Gln Arg Leu Gly Met Gly
 10205 10210 10215

Ala Gln Leu Tyr Glu Gln Phe Pro Val Phe Ala Ala Ala Phe Asp
 10220 10225 10230

Asp Val Val Asp Ala Leu Asp Gln Tyr Leu Arg Leu Pro Leu Arg
 10235 10240 10245

Gln Val Met Trp Gly Asp Asp Glu Gly Leu Leu Asn Ser Thr Glu
 10250 10255 10260

Phe Ala Gln Pro Ser Leu Phe Ala Val Glu Val Ala Leu Phe Ala
 10265 10270 10275

Leu Leu Arg Phe Trp Gly Val Val Pro Asp Tyr Val Ile Gly His
 10280 10285 10290

Ser Val Gly Glu Leu Ala Ala Ala Gln Val Ala Gly Val Leu Ser
 10295 10300 10305

Leu Gln Asp Ala Ala Lys Leu Val Ser Ala Arg Gly Arg Leu Met
 10310 10315 10320

Gln Ala Leu Pro Ala Gly Gly Ala Met Val Ala Val Ala Ala Ser
 10325 10330 10335

Gln His Glu Val Glu Pro Leu Leu Val Glu Gly Val Asp Ile Ala
 10340 10345 10350

Ala Leu Asn Ala Pro Gly Ser Val Val Ile Ser Gly Asp Gln Ala
 10355 10360 10365

Ala Val Arg Leu Ile Ala Asn Arg Leu Ala Asp Arg Gly Tyr Arg
 10370 10375 10380

Ala His Glu Leu Ala Val Ser His Ala Phe His Ser Ser Leu Met
 10385 10390 10395

Glu Pro Met Leu Glu Glu Phe Ala Arg Leu Ala Ser Glu Ile Val
 10400 10405 10410

Val Glu Gln Pro Gln Ile Pro Leu Ile Ser Asn Val Thr Gly Gln
 10415 10420 10425

Leu Ala Asn Ala Asp Tyr Gly Ser Ala Gly Tyr Trp Val Asp His
 10430 10435 10440

Ile Arg Arg Pro Val Arg Phe Ala Asp Ser Val Ala Ser Leu Glu
 10445 10450 10455

Ala Met Gly Ala Ser Cys Phe Ile Glu Val Gly Pro Ala Ser Gly
 10460 10465 10470

Leu Gly Ala Ala Ile Glu Gln Ser Leu Lys Ser Ala Glu Pro Thr
 10475 10480 10485

Val Ser Val Ser Ala Leu Ser Thr Asp Lys Pro Glu Ser Val Ala
 10490 10495 10500

Val Leu Arg Ala Ala Ala Arg Leu Ser Thr Ser Gly Ile Pro Val
 10505 10510 10515

Asp Trp Gln Ser Val Phe Asp Gly Arg Ser Thr Gln Thr Val Asn
 10520 10525 10530

Leu Pro Thr Tyr Ala Phe Gln Arg Gln Arg Phe Trp Leu Asp Ala
 10535 10540 10545

Asn Arg Ile Gly Gln Gly Asp Pro Ala Ser Gln Pro Gln Ala Gln
 10550 10555 10560

Asn Val Glu Ser Arg Phe Trp Glu Ala Val Glu Arg Glu Asp Val
 10565 10570 10575

Asp Gly Leu Ala Asp Ser Ile Gly Val Thr Ala Ser Ala Met Gln
 10580 10585 10590

Thr Val Leu Pro Ala Leu Ser Ser Trp Arg Arg Ala Glu Arg Thr
 10595 10600 10605

Gln Ser Glu Leu Asp Ser Trp Arg Tyr Gln Val Thr Trp Leu Ser
 10610 10615 10620

Ser Pro Ala Thr Pro Ser Ser Ile Thr Leu Ser Gly Ile Trp Leu
 10625 10630 10635

Leu Ile Val Pro Ser Glu Leu Ala Lys Thr Asp Pro Val Ile Gly
 10640 10645 10650

Cys Ala Ala Ala Leu Glu Ala His Gly Ala Leu Val Thr Ile Ile
 10655 10660 10665

Thr Ile Phe Glu Pro Asp Phe Asn Arg Ser Leu Met Gly Ala Ser
 10670 10675 10680

Leu Lys Asp Ile Gly Ser His Ile Ser Gly Val Ile Ser Phe Leu
 10685 10690 10695

Gly Ile His Gly Ser Glu Phe Ser Asp Ser Gly Ala Val Lys Thr
 10700 10705 10710

Leu Asn Leu Val Gln Ala Met Gly Asp Val His Leu Asp Val Pro
 10715 10720 10725

Leu Trp Cys Leu Thr Gln Gly Ala Val Ser Ile Ser Ala Asp Asp
 10730 10735 10740

Leu Ile Arg Cys Ser Ser Ala Ala Leu Val Trp Gly Leu Gly Arg
 10745 10750 10755

Val Val Ala Leu Glu His Pro Gly Ser Trp Gly Gly Leu Val Asp
 10760 10765 10770

Leu Pro Glu Ser Pro Asp Asp Ala Ala Trp Glu Arg Leu Cys Ala
 10775 10780 10785

Leu Leu Ala Gln Pro Thr Asp Glu Asp Gln Phe Ala Ile Arg Pro
 10790 10795 10800

Ser Gly Val Phe Leu Arg Arg Leu Ile His Ala Pro Ala Thr Thr
 10805 10810 10815

Thr Ser Lys Ser Ser Thr Ala Trp Ala Pro Arg Gly Thr Val Leu
 10820 10825 10830

Ile Thr Gly Gly Thr Gly Ala Leu Gly Ala His Val Ala Arg Trp
 10835 10840 10845

Leu Ala His Lys Tyr Glu Ser Val Asp Leu Leu Leu Thr Ser Arg
 10850 10855 10860

Arg Gly Met Ala Ala Asp Gly Ala Thr Glu Leu Val Asp Asp Leu
 10865 10870 10875

Arg Thr Ala Gly Ala Ser Val Thr Val His Ala Cys Asp Val Thr
 10880 10885 10890

Asp Arg Thr Ser Val Glu Ala Ala Ile Ala Gly Lys Ser Leu Asp
 10895 10900 10905

Ala Val Phe His Leu Ala Gly Arg His Gln Pro Thr Leu Leu Thr
 10910 10915 10920

Glu Leu Glu Asp Glu Ser Phe Ser Asp Glu Leu Ala Pro Lys Val
 10925 10930 10935

His Gly Ala Gln Val Leu Ser Asp Ile Thr Ser Asn Leu Thr Leu
 10940 10945 10950

Ser Ala Phe Val Met Phe Ser Ser Val Ala Gly Ile Trp Gly Gly
 10955 10960 10965

Lys Ser Gln Gly Ala Tyr Ala Ala Ala Asn Ala Phe Leu Asp Ser
 10970 10975 10980

Leu Ala Glu Lys Arg Arg Thr Leu Gly Leu Pro Ala Thr Ser Val
 10985 10990 10995

Ala Trp Gly Leu Trp Ala Gly Gly Gly Met Gly Asp Arg Pro Ser
 11000 11005 11010

Ala Ser Gly Leu Asn Leu Ile Gly Leu Lys Ser Met Ser Ala Asp
 11015 11020 11025

Leu Ala Val Gln Ala Leu Ser Asp Ala Ile Asp Arg Pro Gln Ala
 11030 11035 11040

Thr Leu Thr Val Ala Ser Val Asn Trp Asp Arg Phe Tyr Pro Thr
 11045 11050 11055

Phe Ala Leu Ala Arg Pro Arg Pro Phe Leu His Glu Ile Thr Glu
 11060 11065 11070

Val Met Ala Tyr Arg Glu Ser Met Arg Ser Ser Ser Ala Ser Thr
 11075 11080 11085

Ala Thr Leu Leu Thr Ser Lys Leu Ala Gly Leu Thr Ala Thr Glu
 11090 11095 11100

Gln Arg Ala Val Thr Arg Lys Leu Val Leu Asp Gln Ala Ala Ser
 11105 11110 11115

Val Leu Gly Tyr Ala Ser Thr Glu Ser Leu Asp Thr His Glu Ser
 11120 11125 11130

Phe Lys Asp Leu Gly Phe Asp Ser Leu Thr Ala Leu Glu Leu Arg
 11135 11140 11145

Asp His Leu Gln Thr Ala Thr Gly Leu Asn Leu Ser Ser Thr Leu
 11150 11155 11160

Ile Phe Asp His Pro Thr Pro His Ala Val Ala Glu His Leu Leu
 11165 11170 11175

Glu Gln Ile Pro Gly Ile Gly Ala Leu Val Pro Ala Pro Val Val
 11180 11185 11190

Ile Ala Ala Gly Arg Thr Glu Glu Pro Val Ala Val Val Gly Met
 11195 11200 11205

Ala Cys Arg Phe Pro Gly Gly Val Ala Ser Ala Asp Gln Leu Trp
 11210 11215 11220

Asp Leu Val Ile Ala Gly Arg Asp Val Val Gly Asn Phe Pro Ala
 11225 11230 11235

Asp Arg Gly Trp Asp Val Glu Gly Leu Phe Asp Pro Asp Pro Asp
 11240 11245 11250

Ala Val Gly Lys Thr Tyr Thr Arg Tyr Gly Ala Phe Leu Asp Asp
 11255 11260 11265

Ala Ala Gly Phe Asp Ala Gly Phe Phe Gly Ile Ser Pro Arg Glu
 11270 11275 11280

Ala Arg Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Val Cys
 11285 11290 11295

Trp Glu Ala Leu Glu Thr Ala Gly Ile Pro Ala His Thr Leu Ala
 11300 11305 11310

Gly Thr Ser Thr Gly Val Phe Ala Gly Ala Trp Ala Gln Ser Tyr
 11315 11320 11325

Gly Ala Thr Asn Ser Asp Asp Ala Glu Gly Tyr Ala Met Thr Gly
 11330 11335 11340

Gly Ser Thr Ser Val Met Ser Gly Arg Ile Ala Tyr Thr Leu Gly
 11345 11350 11355

Leu Glu Gly Pro Ala Ile Thr Val Asp Thr Ala Cys Ser Ser Ser
 11360 11365 11370

Leu Val Ala Ile His Leu Ala Cys Gln Ser Leu Arg Asn Asn Glu
 11375 11380 11385

Ser Gln Leu Ala Leu Ala Gly Gly Val Thr Val Met Ser Thr Pro
 11390 11395 11400

Ala Ile Phe Thr Glu Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp
 11405 11410 11415

Gly Arg Cys Lys Ala Phe Ala Ala Thr Ala Asp Gly Thr Gly Phe
 11420 11425 11430

Gly Glu Gly Ala Ala Val Leu Val Leu Glu Arg Leu Ser Glu Ala
 11435 11440 11445

Arg Arg Asn Asn His Pro Val Leu Ala Ile Val Ala Gly Ser Ala
 11450 11455 11460

Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro His Gly
 11465 11470 11475

Pro Ser Gln Gln Arg Val Ile Asn Gln Ala Leu Ala Asn Ala Gly
 11480 11485 11490

Leu Thr His Asp Gln Val Asp Ala Val Glu Ala His Gly Thr Gly
 11495 11500 11505

Thr Thr Leu Gly Asp Pro Ile Glu Ala Ser Ala Leu His Ala Thr
 11510 11515 11520

Tyr Gly His His His Thr Pro Asp Gln Pro Leu Trp Leu Gly Ser
 11525 11530 11535

Ile Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala Gly Ala Ala
 11540 11545 11550

Gly Val Val Lys Met Ile Gln Ala Ile Thr His Ala Thr Leu Pro
 11555 11560 11565

Ala Thr Leu His Val Asp Gln Pro Ser Pro His Ile Asp Trp Ser
 11570 11575 11580

Ser Gly Thr Val Arg Leu Leu Thr Glu Pro Ile Gln Trp Pro Asn
 11585 11590 11595

Thr Asp His Pro Arg Thr Ala Ala Val Ser Ser Phe Gly Ile Ser
 11600 11605 11610

Gly Thr Asn Ala His Leu Ile Leu Gln Gln Pro Pro Thr Pro Asp
 11615 11620 11625

Thr Thr Gln Thr Pro Asn Thr Thr Thr Gly Ser Asp Pro Ala Val
 11630 11635 11640

Gly Ser Asp Pro Ala Val Gly Val Leu Val Trp Pro Leu Ser Ala
 11645 11650 11655

Arg Ser Ala Pro Gly Leu Ser Ala Gln Ala Ala Arg Leu Tyr Gln
 11660 11665 11670

His Leu Ser Ala His Pro Asp Leu Asp Pro Ile Asp Val Ala His
 11675 11680 11685

Ser Leu Ala Thr Thr Arg Ser His His Pro His Arg Ala Thr Ile
11690 11695 11700

Thr Thr Ser Ile Glu His His Ser Glu Asn Asn His Asp Thr Thr
11705 11710 11715

Asp Ala Leu Ala Ala Leu His Ala Leu Ala Asn Asn Gly Thr His
11720 11725 11730

Pro Leu Leu Ser Arg Gly Leu Leu Thr Pro Gln Gly Pro Gly Lys
11735 11740 11745

Thr Val Phe Val Phe Pro Gly Gln Gly Ser Gln Tyr Pro Gly Met
11750 11755 11760

Gly Ala Asp Leu Tyr Arg Gln Phe Pro Val Phe Ala His Ala Leu
11765 11770 11775

Asp Ala Cys Asp Ala Ala Leu Gln Pro Phe Thr Gly Trp Ser Val
11780 11785 11790

Leu Ala Val Leu His Asp Glu Pro Glu Ala Pro Ser Leu Glu Arg
11795 11800 11805

Val Asp Val Val Gln Pro Val Leu Phe Ser Val Met Val Ser Leu
11810 11815 11820

Ala Ala Leu Trp Arg Trp Ala Gly Ile Thr Pro Asp Ala Val Ile
11825 11830 11835

Gly His Ser Gln Gly Glu Ile Ala Ala Ala His Val Ala Gly Ala
11840 11845 11850

Leu Thr Leu Pro Glu Ala Ala Ala Val Val Ala Leu Arg Ser Arg
11855 11860 11865

Val Leu Thr Asp Leu Ala Gly Ala Gly Ala Met Ala Ser Val Leu
11870 11875 11880

Ser Pro Glu Glu Pro Leu Thr Gln Leu Leu Ala Arg Trp Asp Gly
11885 11890 11895

Lys Ile Thr Val Ala Ala Val Asn Gly Pro Ala Ser Ala Val Val
11900 11905 11910

Ser Gly Asp Thr Thr Ala Ile Thr Glu Leu Leu Ile Thr Cys Glu
 11915 11920 11925

His Glu Asn Ile Asp Ala Arg Ala Ile Pro Val Asp Tyr Pro Ser
 11930 11935 11940

His Ser Pro Tyr Met Glu His Ile Arg His Gln Phe Leu Asp Glu
 11945 11950 11955

Leu Pro Glu Leu Thr Pro Arg Pro Ser Thr Ile Ala Met Tyr Ser
 11960 11965 11970

Thr Val Asp Gly Glu Pro His Asp Thr Ala Tyr Asp Thr Thr Thr
 11975 11980 11985

Met Thr Ala Asp Tyr Trp Tyr Arg Asn Ile Arg Asn Thr Val Arg
 11990 11995 12000

Phe His Asp Thr Val Ala Ala Leu Leu Gly Ala Gly Glu Gln Val
 12005 12010 12015

Phe Leu Glu Leu Ser Pro His Pro Val Leu Thr Gln Ala Ile Thr
 12020 12025 12030

Asp Thr Val Glu Gln Ala Gly Gly Gly Gly Ala Ala Val Pro Ala
 12035 12040 12045

Leu Arg Lys Asp Arg Pro Asp Ala Val Ala Phe Ala Ala Ala Leu
 12050 12055 12060

Gly Gln Leu His Cys His Gly Ile Ser Pro Ser Trp Asn Val Leu
 12065 12070 12075

Tyr Cys Gln Ala Arg Pro Leu Thr Leu Pro Thr Tyr Ala Phe Gln
 12080 12085 12090

His Gln Arg Tyr Trp Leu Leu Pro Thr Ala Gly Asp Phe Ser Gly
 12095 12100 12105

Ala Asn Thr His Ala Met His Pro Leu Leu Asp Thr Ala Thr Glu
 12110 12115 12120

Leu Ala Glu Asn Arg Gly Trp Val Phe Thr Gly Arg Ile Ser Pro
 12125 12130 12135

Arg Thr Gln Pro Trp Leu Asn Glu His Ala Val Glu Ser Ala Val

12140	12145	12150
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Leu Phe Pro Gly Thr Gly Phe Val Glu Leu Ala Leu His Val Ala
12155 12160 12165

Asp Arg Ala Gly Tyr Ser Ser Val Asn Glu Leu Ile Val His Thr
12170 12175 12180

Pro Leu Leu Leu Ala Gly His Asp Thr Ala Asp Leu Gln Ile Thr
12185 12190 12195

Val Thr Asp Thr Asp Asp Met Gly Arg Gln Ser Leu Asn Ile His
12200 12205 12210

Ser His Pro His Ile Gly His Asp Asn Thr Thr Thr Gly Asp Glu
12215 12220 12225

Gln Pro Glu Trp Val Leu His Ala Ser Ala Val Leu Thr Ala Gln
12230 12235 12240

Thr Thr Asp His Asn His Leu Pro Leu Thr Pro Val Pro Trp Pro
12245 12250 12255

Pro Pro Gly Thr Ala Ala Ile Glu Val Asp Asp Phe Tyr Asp Asp
12260 12265 12270

Leu Ala Ala Gln Gly Tyr Asn Tyr Gly Pro Thr Phe Gln Gly Val
12275 12280 12285

Gln Arg Ile Trp Arg Asp His Ala Thr Pro Asp Val Ile Tyr Ala
12290 12295 12300

Glu Val Glu Leu Pro Glu Asp Thr Asp Ile Asp Gly Tyr Gly Ile
12305 12310 12315

His Pro Ala Leu Phe Asp Ala Ala Leu His Pro Leu Leu Ala Leu
12320 12325 12330

Thr Gln Pro Pro Thr Asn Asp Thr Asp Asp Thr Asn Thr Ala Asp
12335 12340 12345

Thr Gly Asp Gln Val Arg Leu Pro Tyr Ala Phe Thr Gly Ile Ser
12350 12355 12360

Leu His Ala Thr His Ala Thr Arg Leu Arg Val Arg Leu Thr Arg
12365 12370 12375

Thr Gly Ala Asp Ala Ile Thr Val His Thr Ser Asp Thr Thr Gly
12380 12385 12390

Ala Pro Val Ala Ile Ile Asp Ser Leu Ile Thr Arg Pro Leu Thr
12395 12400 12405

Thr Ala Thr Gly Ser Ala Pro Ala Thr Thr Ala Ala Gly Leu Leu
12410 12415 12420

His Leu Ser Trp Pro Pro His Pro Asp Thr Thr Thr Asp Thr Asp
12425 12430 12435

Thr Asp Thr Asp Ala Leu Arg Tyr Gln Val Ile Ala Glu Pro Thr
12440 12445 12450

Gln Gln Leu Pro Arg Tyr Leu His Asp Leu His Thr Ser Thr Thr
12455 12460 12465

Glu Ala Asp Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu
12470 12475 12480

Glu Leu Gln Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg
12485 12490 12495

Ile His Thr Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp
12500 12505 12510

Leu Thr His Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr
12515 12520 12525

Arg His Gly Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu
12530 12535 12540

Ala His Ala Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu
12545 12550 12555

His Pro Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn
12560 12565 12570

Ser Asp Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn
12575 12580 12585

Gln Leu Ala Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr
 12590 12595 12600

Arg His Ser Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp
 12605 12610 12615

Pro Glu Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly
 12620 12625 12630

Ala Leu Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His
 12635 12640 12645

Leu Leu Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr
 12650 12655 12660

Asp Leu Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile
 12665 12670 12675

Thr Ala Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val
 12680 12685 12690

Asn Ser Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr
 12695 12700 12705

Ala Ala Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp
 12710 12715 12720

Gln Leu Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln
 12725 12730 12735

Leu His Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met
 12740 12745 12750

Phe Ser Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn
 12755 12760 12765

Tyr Ala Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg
 12770 12775 12780

His Arg Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp
 12785 12790 12795

Gln Thr His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu
 12800 12805 12810

Ala Arg Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His

12815	12820	12825
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Gly Leu Ala Leu Phe Asp Ala	Ala Leu Ala Thr Gly	Gln Pro Val
12830	12835	12840

Ser Ile Pro Ala Pro Ile Asn	Thr His Thr Leu Ala	Arg His Ala
12845	12850	12855

Arg Asp Asn Thr Leu Ala Pro	Ile Leu Ser Ala Leu	Ile Thr Thr
12860	12865	12870

Pro Arg Arg Arg Ala Ala Ser	Ala Ala Thr Asp Leu	Ala Ala Arg
12875	12880	12885

Leu Asn Gly Leu Ser Pro Gln	Gln Gln Gln Gln Thr	Leu Ala Thr
12890	12895	12900

Leu Val Ala Ala Ala Thr Ala	Thr Val Leu Gly His	His Thr Pro
12905	12910	12915

Glu Ser Ile Ser Pro Ala Thr	Ala Phe Lys Asp Leu	Gly Ile Asp
12920	12925	12930

Ser Leu Thr Ala Leu Glu Leu	Arg Asn Thr Leu Thr	His Asn Thr
12935	12940	12945

Gly Leu Asp Leu Pro Pro Thr	Leu Ile Phe Asp His	Pro Thr Pro
12950	12955	12960

His Ala Val Ala Glu His Leu	Leu Glu Gln Ile Pro	Gly Ile Gly
12965	12970	12975

Ala Leu Val Pro Ala Pro Val	Val Ile Ala Ala Gly	Arg Thr Glu
12980	12985	12990

Glu Pro Val Ala Val Val Gly	Met Ala Cys Arg Phe	Pro Gly Gly
12995	13000	13005

Val Ala Ser Ala Asp Gln Leu	Trp Asp Leu Val Ile	Ala Gly Arg
13010	13015	13020

Asp Val Val Gly Asn Phe Pro	Ala Asp Arg Gly Trp	Asp Val Glu
13025	13030	13035

Gly Leu Phe Asp Pro Asp Pro	Asp Ala Val Gly Lys	Thr Tyr Thr
13040	13045	13050

Arg Tyr Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly
 13055 13060 13065

Phe Phe Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln
 13070 13075 13080

Gln Arg Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala
 13085 13090 13095

Gly Ile Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe
 13100 13105 13110

Ala Gly Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp
 13115 13120 13125

Ala Glu Gly Tyr Ala Met Thr Gly Gly Ser Thr Ser Val Met Ser
 13130 13135 13140

Gly Arg Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr
 13145 13150 13155

Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala
 13160 13165 13170

Cys Gln Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly
 13175 13180 13185

Gly Val Thr Val Met Ser Thr Pro Ala Val Phe Thr Glu Phe Ser
 13190 13195 13200

Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala
 13205 13210 13215

Ala Thr Ala Asp Gly Thr Gly Phe Gly Glu Gly Ala Ala Val Leu
 13220 13225 13230

Val Leu Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val
 13235 13240 13245

Leu Ala Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser
 13250 13255 13260

Asn Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile
 13265 13270 13275

Asn Gln Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp
 13280 13285 13290

Ala Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile
 13295 13300 13305

Glu Ala Ser Ala Leu His Ala Thr Tyr Gly His His His Thr Pro
 13310 13315 13320

Asp Gln Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His
 13325 13330 13335

Thr Gln Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln
 13340 13345 13350

Ala Ile Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln
 13355 13360 13365

Pro Ser Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu
 13370 13375 13380

Thr Glu Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala
 13385 13390 13395

Ala Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile
 13400 13405 13410

Leu Gln Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn Thr
 13415 13420 13425

Thr Thr Gly Ser Asp Pro Ala Val Gly Ser Asp Pro Ala Val Gly
 13430 13435 13440

Val Leu Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu Ser
 13445 13450 13455

Ala Gln Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro Asp
 13460 13465 13470

Leu Asp Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser
 13475 13480 13485

His His Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His
 13490 13495 13500

Ser Glu Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His
13505 13510 13515

Ala Leu Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu
13520 13525 13530

Leu Thr Pro Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly
13535 13540 13545

Gln Gly Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln
13550 13555 13560

Phe Pro Val Phe Ala His Ala Leu Asp Ala Cys Asp Ala Ala Leu
13565 13570 13575

Gln Pro Phe Thr Gly Trp Ser Val Leu Ala Val Leu His Asp Glu
13580 13585 13590

Pro Glu Ala Pro Ser Leu Glu Arg Val Asp Val Val Gln Pro Val
13595 13600 13605

Leu Phe Ser Val Met Val Ser Leu Ala Ala Leu Trp Arg Trp Ala
13610 13615 13620

Gly Ile Thr Pro Asp Ala Val Ile Gly His Ser Gln Gly Glu Ile
13625 13630 13635

Ala Ala Ala His Val Ala Gly Ala Leu Thr Leu Pro Glu Ala Ala
13640 13645 13650

Ala Val Val Ala Leu Arg Ser Arg Val Leu Thr Asp Leu Ala Gly
13655 13660 13665

Ala Gly Ala Met Ala Ser Val Leu Ser Pro Glu Glu Pro Leu Thr
13670 13675 13680

Gln Leu Leu Ala Arg Trp Asp Gly Lys Ile Thr Val Ala Ala Val
13685 13690 13695

Asn Gly Pro Ala Ser Ala Val Val Ser Gly Asp Thr Thr Ala Ile
13700 13705 13710

Thr Glu Leu Leu Ile Thr Cys Glu His Glu Asn Ile Asp Ala Arg
13715 13720 13725

Ala Ile Pro Val Asp Tyr Pro Ser His Ser Pro Tyr Met Glu His
13730 13735 13740

Ile Arg His Gln Phe Leu Asp Glu Leu Pro Glu Leu Thr Pro Arg
13745 13750 13755

Pro Ser Thr Ile Ala Met Tyr Ser Thr Val Asp Gly Glu Pro His
13760 13765 13770

Asp Thr Ala Tyr Asp Thr Thr Thr Met Thr Ala Asp Tyr Trp Tyr
13775 13780 13785

Arg Asn Ile Arg Asn Thr Val Arg Phe His Asp Thr Val Ala Ala
13790 13795 13800

Leu Leu Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro His
13805 13810 13815

Pro Val Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly
13820 13825 13830

Gly Gly Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp
13835 13840 13845

Ala Val Ala Phe Ala Ala Ala Leu Gly Gln Leu His Cys His Gly
13850 13855 13860

Ile Ser Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu
13865 13870 13875

Thr Leu Pro Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu
13880 13885 13890

Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met His
13895 13900 13905

Pro Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp
13910 13915 13920

Val Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu Asn
13925 13930 13935

Glu His Ala Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly Phe
13940 13945 13950

Val Glu Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser
 13955 13960 13965

Val Asn Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly His
 13970 13975 13980

Asp Thr Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met
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Pro Asp Thr Thr Thr Asp Thr Asp Thr Asp Ala Leu Arg
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His Asp Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Thr Glu
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Pro Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser
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Thr Gly Met Thr Val Ser Gly Ala Phe Ala Pro Ser Thr Val Ala
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Asp His Arg Met Val Met Thr Ile Pro Ala Arg Trp Ser Phe Pro
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Gln Ala Ala Ser Ile Pro Val Val Phe Leu Thr Ala Tyr Ile Ala
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Leu Ala Glu Ile Ser Gly Leu Ser Arg Gly Gln Arg Val Leu Ile
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His Ala Gly Thr Gly Gly Val Gly Met Ala Ala Ile Gln Leu Ala
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His His Leu Gly Ala Glu Val Phe Ala Thr Ala Ser Ala Ala Lys
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Trp Ser Thr Leu Glu Ala Leu Gly Val Pro Arg Asp His Ile Ala
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Ser Ser Arg Thr Leu Asp Phe Ser Asn Ala Phe Leu Asp Ala Thr
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Phe Val Glu Ala Ser Leu Ala Leu Leu Pro Arg Gly Gly His Phe
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Val Glu Ile Gly Lys Thr Asp Ile Arg Asp Thr Glu Val Ile Ala
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Ala Thr His Pro Gly Val Ile Tyr Arg Ala Leu Asp Leu Leu Ser
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Val Ser Pro Asp His Ile Gln Arg Thr Leu Ala Gln Leu Ser Pro
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Ser Ile Tyr Gln Ala Ile Ser Ala Leu Arg Asp Met Ser Gln Ala
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Arg His Thr Gly Lys Ile Val Leu Thr Ala Pro Val Val Val Asp
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Pro Glu Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly
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His Arg Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp
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Tyr Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe
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Val Thr Val Met Ser Thr Pro Ala Val Phe Thr Asp Phe Ser Arg

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15315

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Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn
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Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu
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Ala Gly Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp
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Gln Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr
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Gln Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala
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Ile Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro
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Ser Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr
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Glu Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala
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Val Met Phe Ser Gln Gln Asp Thr Ala Met Ala Gln Leu Leu Asp
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Gln Thr Phe Tyr Ala Gln Pro Ala Leu Phe Ala Leu Gly Thr Ala
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Leu His Arg Leu Phe Thr His Ala Gly Ile His Pro Asp Tyr Leu
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Leu Gly His Ser Ile Gly Glu Leu Thr Ala Ala Tyr Ala Ala Gly

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Arg Leu Met Gln Ser Cys Thr	Pro Gly Gly Thr Met	Leu Ala Leu
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Gln Ala Ser Glu Ala Glu Val	Gln Pro Leu Leu Glu	Gly Leu Asp
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Leu Ser Gly Asp His Asp Ser	Leu Glu Gln Ile Gly	Glu His Phe
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Ile Thr Gln Asp Arg Arg Thr	Thr Arg Leu Gln Val	Ser His Ala
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Phe His Ser Pro His Met Asp	Pro Ile Leu Glu Gln	Phe Arg Gln
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Pro Asp Tyr Trp Thr Gln Gln	Leu Arg Asn Thr Val	Arg Phe His
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Glu Leu Ser Pro His Pro Val	Leu Thr Gln Ala Ile	Thr Asp Thr
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Val Glu Gln Ala Gly Gly Gly	Gly Ala Ala Val Pro	Ala Leu Arg
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Lys Asp Arg Pro Asp Ala Val	Ala Phe Ala Ala Ala	Leu Gly Gln
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Arg Tyr Trp Leu Leu Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn
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Glu Asn Arg Gly Trp Val Phe Thr Gly Arg Ile Ser Pro Arg Thr
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Gln Pro Trp Leu Asn Glu His Ala Val Glu Ser Ala Val Leu Phe
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Pro Asn Thr Gly Phe Val Glu Leu Ala Leu His Val Ala Asp Arg
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Ala Gly Tyr Ser Ser Val Asn Glu Leu Ile Val His Thr Pro Leu
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Ser Trp Pro Pro His Pro Asp Thr Thr Thr Asp Thr Asp
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Pro Ile Ala Thr Ser His Gly Leu Ala Leu Phe Asp Ala Ala Leu
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Ala Thr Gly Gln Pro Val Ser Ile Pro Ala Pro Ile Asn Thr His
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Phe Asp His Pro Thr Pro Thr Ala Leu Thr Gln His Leu His Thr
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Arg Leu Thr Gln Ile Glu Ser Pro Asn Ser Glu Asp Ser Met Leu
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Ser Gly Glu Asp Arg Ala His Val Ile Ala Asn Arg Leu Arg Ser
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Glu Leu His Leu Glu Ser Ala Thr Asp Asp Glu Leu Phe Ser Leu
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<213> Mycobacterium ulcerans

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35 40 45

Gly Val Ala Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg
50 55 60

Asp Val Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly
65 70 75 80

Leu Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr
85 90 95

Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe Gly
100 105 110

Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg Leu Leu
115 120 125

Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile Pro Ala His
130 135 140

Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Val Gly Ala Trp Ala Gln
145 150 155 160

Ser Tyr Gly Ala Thr Asn Ser Asp Gly Ala Glu Gly Tyr Ala Met Thr
165 170 175

Gly Gly Ser Thr Ser Val Met Ser Gly Arg Ile Ala Tyr Thr Leu Gly
180 185 190

Leu Glu Gly Pro Ala Ile Thr Val Asp Thr Ala Cys Ser Ser Ser Leu
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Val Ala Ile His Leu Ala Cys Gln Ser Leu Arg Asn Asn Glu Ser Gln
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Leu Ala Leu Ala Gly Gly Val Thr Val Met Ser Thr Pro Ala Val Phe
225 230 235 240

Thr Glu Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys
245 250 255

Ala Phe Ala Ala Thr Ala Asp Gly Thr Gly Trp Gly Glu Gly Ala Ala
260 265 270

Val Leu Val Leu Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro
275 280 285

Val Leu Ala Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser
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Asn Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn
305 310 315 320

Gln Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala Val
325 330 335

Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala Ser
340 345 350

Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp Gln Pro Leu
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Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala
370 375 380

Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile Thr His Ala Thr
385 390 395 400

Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser Pro His Ile Asp Trp
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Ser Ser Gly Thr Val Arg Leu Leu Thr Glu Pro Ile Gln Trp Pro Asn
420 425 430

Thr Asp His Pro Arg Thr Ala Ala Val Ser Ser Phe Gly Ile Ser Gly
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Thr Asn Ala His Leu Ile Leu Gln Gln Pro Pro Thr Pro Asp Thr Thr
450 455 460

Gln Thr Pro Asn Thr Thr Gly Ser Asp Pro Ala Val Gly Ser Asp
465 470 475 480

Ser Ala Val Gly Ser Asp Pro Ala Val Gly Val Leu Val Trp Pro Leu
485 490 495

Ser Ala Arg Ser Ala Pro Gly Leu Ser Ala Gln Ala Ala Arg Leu Tyr
500 505 510

Gln His Leu Ser Ala His Pro Asp Leu Asp Pro Ile Asp Val Ala His
515 520 525

Ser Leu Ala Thr Thr Arg Ser His His Pro His Arg Ala Thr Ile Thr
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Thr Ser Ile Glu His His Ser Glu Asn Asn His Asp Thr Thr Asp Ala
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Leu Ala Ala Leu His Ala Leu Ala Asn Asn Gly Thr His Pro Leu Leu
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Ser Arg Gly Leu Leu Thr Pro Gln Gly Pro Gly Lys Thr Val Phe Val
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Phe Pro Gly Gln Gly Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr
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Arg Gln Phe Pro Val Phe Ala His Ala Leu Asp Glu Val Ala Ala Ala
610 615 620

Leu Asn Pro His Leu Asp Val Ala Leu Leu Glu Val Met Phe Ser Gln
625 630 635 640

Gln Asp Thr Ala Met Ala Gln Leu Leu Asp Gln Thr Phe Tyr Ala Gln
645 650 655

Pro Ala Leu Phe Ala Leu Gly Thr Ala Leu His Arg Leu Phe Thr His
660 665 670

Ala Gly Ile His Pro Asp Tyr Leu Leu Gly His Ser Ile Gly Glu Leu
675 680 685

Thr Ala Ala Tyr Ala Ala Gly Val Leu Ser Leu Gln Asp Ala Ala Thr
690 695 700

Leu Val Thr Ser Arg Gly Arg Leu Met Gln Ser Cys Thr Pro Gly Gly
705 710 715 720

Thr Met Leu Ala Leu Gln Ala Ser Glu Ala Glu Val Gln Pro Leu Leu
725 730 735

Glu Gly Leu Asp His Ala Val Ser Ile Ala Ala Ile Asn Gly Ala Thr
740 745 750

Ser Ile Val Leu Ser Gly Asp His Asp Ser Leu Glu Gln Ile Gly Glu
755 760 765

His Phe Ile Thr Gln Asp Arg Arg Thr Thr Arg Leu Gln Val Ser His
770 775 780

Ala Phe His Ser Pro His Met Asp Pro Ile Leu Glu Gln Phe Arg Gln
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Tyr Trp Thr Gln Gln Leu Arg Asn Thr Val Arg Phe His Asp Thr Val
835 840 845

Ala Ala Leu Leu Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro
850 855 860

His Pro Val Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly
865 870 875 880

Gly Gly Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp Ala
885 890 895

Val Ala Phe Ala Ala Leu Gly Gln Leu His Cys His Gly Ile Ser
900 905 910

Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu Thr Leu Pro
915 920 925

Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu Pro Thr Ala Gly
930 935 940

Asp Phe Ser Gly Ala Asn Thr His Ala Met His Pro Leu Leu Asp Thr
945 950 955 960

Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp Val Phe Thr Gly Arg Ile
965 970 975

Ser Pro Arg Thr Gln Pro Trp Leu Asn Glu His Ala Val Glu Ser Ala
980 985 990

Val Leu Phe Pro Gly Thr Gly Phe Val Glu Leu Ala Leu His Val Ala
995 1000 1005

Asp Arg Ala Gly Tyr Ser Ser Val Asn Glu Leu Ile Val His Thr
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Pro Leu Leu Leu Ala Gly His Asp Thr Ala Asp Leu Gln Ile Thr
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Val Thr Asp Thr Asp Asp Met Gly Arg Gln Ser Leu Asn Ile His
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Ser His Pro His Ile Gly His Asp Asn Thr Thr Thr Gly Asp Glu
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Gln Pro Glu Trp Val Leu His Ala Ser Ala Val Leu Thr Ala Gln
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Thr Thr Asp His Asn His Leu Pro Leu Thr Pro Val Pro Trp Pro
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Pro Pro Gly Thr Ala Ala Ile Glu Val Asp Asp Phe Tyr Asp Asp
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Leu Ala Ala Gln Gly Tyr Asn Tyr Gly Pro Thr Phe Gln Gly Val
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Gln Arg Ile Trp Arg Asp His Ala Thr Pro Asp Val Ile Tyr Ala
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Glu Val Glu Leu Pro Glu Asp Thr Asp Ile Asp Gly Tyr Gly Ile
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His Pro Ala Leu Phe Asp Ala Ala Leu His Pro Leu Leu Ala Leu
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Thr Gln Pro Pro Thr Asn Asp Thr Asp Asp Thr Asn Thr Ala Asp
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Thr Gly Asp Gln Val Arg Leu Pro Tyr Ala Phe Thr Gly Ile Ser
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Thr Gly Ala Asp Ala Ile Thr Val His Thr Ser Asp Thr Thr Gly
1220 1225 1230

Ala Pro Val Ala Ile Ile Asp Ser Leu Ile Thr Arg Pro Leu Thr
1235 1240 1245

Thr Ala Thr Gly Ser Ala Pro Ala Thr Thr Ala Ala Gly Leu Leu
1250 1255 1260

His Leu Ser Trp Pro Pro His Pro Asp Thr Thr Asp Thr Asp
1265 1270 1275

Thr Asp Thr Asp Ala Leu Arg Tyr Gln Val Ile Ala Glu Pro Thr

1280

1285

1290

Gln Gln Leu Pro Arg Tyr Leu His Asp Leu His Thr Ser Thr Asp
1295 1300 1305

Leu His Thr Ser Thr Thr Glu Ala Asp Val Val Val Trp Pro Val
1310 1315 1320

Pro Val Pro Ser Asn Glu Glu Leu Gln Ala His Gln Ala Ser Asp
1325 1330 1335

Thr Ala Val Ser Ser Arg Ile His Thr Leu Thr Arg Gln Thr Leu
1340 1345 1350

Thr Val Val Gln Asp Trp Leu Thr His Pro Asp Thr Thr Gly Thr
1355 1360 1365

Arg Leu Val Ile Val Thr Arg His Gly Val Ser Thr Ser Ala His
1370 1375 1380

Asp Pro Val Pro Asp Leu Ala His Ala Ala Val Trp Gly Leu Ile
1385 1390 1395

Arg Ser Ala Gln Asn Glu His Pro Gly Arg Phe Thr Leu Leu Asp
1400 1405 1410

Thr Asp Asp Asn Thr Asn Ser Asp Thr Leu Thr Thr Ala Leu Thr
1415 1420 1425

Leu Pro Thr Arg Glu Asn Gln Leu Ala Ile Arg Arg Asp Thr Ile
1430 1435 1440

His Ile Pro Arg Leu Thr Arg Thr Ala Val Leu Thr Pro Pro Asp
1445 1450 1455

Ser Gly Pro Trp Arg Leu Asp Thr Thr Gly Lys Gly Asp Leu Ala
1460 1465 1470

Asn Leu Ala Leu Leu Pro Thr Ala His Thr Ala Leu Ala Ser Gly
1475 1480 1485

Gln Ile Arg Ile Asp Val Arg Ala Ala Gly Leu Asn Phe His Asp
1490 1495 1500

Val Val Val Ala Leu Gly Leu Ile Pro Asp Asp Gly Phe Gly Gly
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Glu Ala Ala Gly Val Ile Ser Glu Ile Gly Pro Asp Val Tyr Gly
1520 1525 1530

Phe Ala Val Gly Asp Ala Val Thr Gly Met Thr Val Ser Gly Ala
1535 1540 1545

Phe Ala Pro Ser Thr Val Ala Asp His Arg Met Val Met Thr Ile
1550 1555 1560

Pro Ala Arg Trp Ser Phe Pro Gln Ala Ala Ser Ile Pro Val Val
1565 1570 1575

Phe Leu Thr Ala Tyr Ile Ala Leu Ala Glu Ile Ser Gly Leu Ser
1580 1585 1590

Arg Gly Gln Arg Val Leu Ile His Ala Gly Thr Gly Gly Val Gly
1595 1600 1605

Met Ala Ala Ile Gln Leu Ala His His Leu Gly Ala Glu Val Phe
1610 1615 1620

Ala Thr Ala Ser Ala Ala Lys Trp Ser Thr Leu Glu Ala Leu Gly
1625 1630 1635

Val Pro Arg Asp His Ile Ala Ser Ser Arg Thr Leu Asp Phe Ser
1640 1645 1650

Asn Ala Phe Leu Asp Ala Thr Asn Gly Ala Gly Val Asp Val Val
1655 1660 1665

Leu Asn Cys Leu Ser Gly Glu Phe Val Glu Ala Ser Leu Ala Leu
1670 1675 1680

Leu Pro Arg Gly Gly His Phe Val Glu Ile Gly Lys Thr Asp Ile
1685 1690 1695

Arg Asp Thr Glu Val Ile Ala Ala Thr His Pro Gly Val Ile Tyr
1700 1705 1710

Arg Ala Leu Asp Leu Leu Ser Val Ser Pro Asp His Ile Gln Arg
1715 1720 1725

Thr Leu Ala Gln Leu Ser Pro Leu Phe Ala Thr Asp Thr Leu Lys
1730 1735 1740

Pro Leu Pro Thr Thr Asn Tyr Ser Ile Tyr Gln Ala Ile Ser Ala
1745 1750 1755

Leu Arg Asp Met Ser Gln Ala Arg His Thr Gly Lys Ile Val Leu
1760 1765 1770

Thr Ala Pro Val Val Val Asp Pro Glu Gly Thr Val Leu Ile Thr
1775 1780 1785

Gly Gly Thr Gly Thr Leu Gly Ala Leu Phe Ala Glu His Leu Val
1790 1795 1800

Ser Ala His Gly Val Arg His Leu Leu Leu Thr Ser Arg Arg Gly
1805 1810 1815

Pro Gln Ala His Gly Ala Thr Asp Leu Gln Gln Arg Leu Thr Asp
1820 1825 1830

Leu Gly Ala His Val Thr Ile Thr Ala Cys Asp Ile Ser Asp Pro
1835 1840 1845

Glu Ala Leu Ala Ala Leu Val Asn Ser Val Pro Thr Gln His Arg
1850 1855 1860

Leu Thr Ala Val Val His Thr Ala Ala Val Leu Ala Asp Thr Pro
1865 1870 1875

Val Thr Glu Leu Thr Gly Asp Gln Leu Asp Gln Val Leu Ala Pro
1880 1885 1890

Lys Ile Asp Ala Ala Trp Gln Leu His Gln Leu Thr Tyr Glu His
1895 1900 1905

Asn Leu Ser Ala Phe Ile Met Phe Ser Ser Met Ala Gly Met Ile
1910 1915 1920

Gly Ser Pro Gly Gln Gly Asn Tyr Ala Ala Ala Asn Thr Ala Leu
1925 1930 1935

Asp Ala Leu Ala Asp Tyr Arg His Arg Leu Gly Leu Pro Ala Thr
1940 1945 1950

Ser Leu Ala Trp Gly Tyr Trp Gln Thr Arg Thr Gly Val Thr Ala
1955 1960 1965

His Leu Thr Asp Val Asp Leu Ala Arg Met Thr Arg Leu Gly Leu
1970 1975 1980

Met Pro Ile Ala Thr Ser His Gly Leu Ala Leu Phe Asp Ala Ala
1985 1990 1995

Leu Ala Thr Gly Gln Pro Val Ser Ile Pro Ala Pro Ile Asn Thr
2000 2005 2010

His Thr Leu Ala Arg His Ala Arg Asp Asn Thr Leu Thr Pro Ile
2015 2020 2025

Leu Ser Ala Leu Ile Thr Thr Pro Arg Arg Arg Ala Ala Ser Ala
2030 2035 2040

Ala Thr Asp Leu Ala Ala Arg Leu Asn Gly Leu Ser Pro Gln Gln
2045 2050 2055

Gln Gln Gln Thr Leu Ala Thr Leu Val Ala Ala Ala Thr Ala Thr
2060 2065 2070

Val Leu Gly His His Thr Pro Glu Ser Ile Ser Pro Ala Thr Ala
2075 2080 2085

Phe Lys Asp Leu Gly Ile Asp Ser Leu Thr Ala Leu Glu Leu Arg
2090 2095 2100

Asn Thr Leu Thr His Asn Thr Gly Leu Asp Leu Pro Pro Thr Leu
2105 2110 2115

Ile Phe Asp His Pro Thr Pro His Ala Leu Thr Gln His Leu His
2120 2125 2130

Thr Arg Leu Thr Gln Ser His Thr Pro Val Gly Pro Ile Ala Ser
2135 2140 2145

Leu Leu Ser His Ala Ile Asp Glu Gly Lys Phe Arg Ala Gly Ala
2150 2155 2160

Asp Leu Leu Met Ala Ala Ser Asn Leu Asn Gln Ser Phe Ser Asn
2165 2170 2175

Met Ala Glu Leu Asn Gln Leu Pro Ala Val Thr Asp Ile Ala Asp
2180 2185 2190

Ala Ser Pro Asp Gly Leu Leu Thr Leu Ile Cys Ile Ser Thr Ser
2195 2200 2205

Glu Asn Glu Tyr Ala Arg Leu Ala Ala Ala Asn Ile His Ser Leu
2210 2215 2220

Thr Phe Ala Glu Ile Ala Ala Pro Gly Phe Tyr Asp Ala Gln Leu
2225 2230 2235

Pro Asn Ser Ile Glu Thr Ser Ala Glu Ala Leu Ala Thr Ala Ile
2240 2245 2250

Thr Gly Ala Tyr Ala Asn Thr Ser Ile Val Leu Val Ala His Ser
2255 2260 2265

Ile Val Cys Glu Leu Ala Gln Ala Thr Met Thr Arg Leu Gln Asp
2270 2275 2280

Ala Asp Ile Asp Leu Val Gly Leu Val Leu Leu Asp Pro Leu Glu
2285 2290 2295

Gly Thr Asn Ser Thr Glu Asp Tyr Val Glu Thr Val Leu Thr Arg
2300 2305 2310

Ile Glu His Ile Asn Ala Pro Arg Val Gly Val Asp Gly Tyr Leu
2315 2320 2325

Ala Ala Leu Gly Arg Tyr Leu Gln Phe His Glu Asp Arg Arg Ile
2330 2335 2340

Pro Ile Pro Glu Thr Arg His Met Thr Leu His Ser Asp Thr Lys
2345 2350 2355

Ile Asp Arg Ala Gln Thr Pro Met Asn Leu Leu Gln Asp Glu Ala
2360 2365 2370

Ala Leu Thr Ala Leu Lys Ile Gly Asn Trp Met Asn Asp Thr Gly
2375 2380 2385

Ser Ile Ala Val Thr Leu Arg Asp Gly Pro Val Phe Leu Gly Arg
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<213> Mycobacterium ulcerans

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<223> Amino acid sequence of the protein encoded by mlsB gene.
<400> 9

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Gly Asp Ala Val Ala Val Val Gly Met Ser Cys Arg Val Pro Gly Ala
20 25 30

Ser Asp Pro Asp Ala Leu Trp Ala Leu Leu Arg Asp Gly Ile Ser Val
35 40 45

Val Asp Glu Ile Pro Ser Ala Arg Trp Asn Leu Asp Gly Leu Val Ala
50 55 60

His Arg Leu Thr Asp Glu Gln Arg Ser Ala Leu Arg His Gly Ala Phe
65 70 75 80

Leu Asp Asp Val Glu Gly Phe Asp Ala Ala Phe Phe Gly Ile Asn Pro
85 90 95

Ser Glu Ala Gly Ser Met Asp Pro Gln Gln Arg Leu Met Leu Glu Leu
100 105 110

Thr Trp Ala Ala Leu Glu Asp Ala Arg Ile Val Pro Glu His Leu Ser
115 120 125

Gly Ser Ser Ser Gly Val Phe Thr Gly Ala Met Ser Asp Asp Tyr Thr
130 135 140

Thr Ala Val Thr Tyr Arg Ala Ala Met Thr Ala His Thr Phe Ala Gly
145 150 155 160

Thr His Arg Ser Leu Ile Ala Asn Arg Val Ser Tyr Thr Leu Gly Leu
165 170 175

Arg Gly Pro Ser Leu Val Ile Asp Thr Gly Gln Ser Ser Ser Leu Val
180 185 190

Ala Val His Val Ala Met Glu Ser Leu Arg Arg Glu Glu Thr Ser Leu
195 200 205

Ala Ile Ala Gly Gly Ile His Leu Asn Leu Ser Leu Ala Ala Ala Leu
210 215 220

Ser Ala Ala His Phe Gly Ala Leu Ser Pro Asp Gly Arg Cys Tyr Thr
225 230 235 240

Phe Asp Ala Arg Ala Asn Gly Tyr Val Arg Gly Glu Gly Gly Val
245 250 255

Val Val Leu Lys Arg Leu Asn Asp Ala Leu Ala Asp Gly Asn His Ile
260 265 270

Tyr Cys Val Ile Arg Gly Ser Ser Val Asn Asn Asp Gly Ala Thr Gln
275 280 285

Asp Leu Thr Ala Pro Gly Val Asp Gly Gln Arg Gln Ala Leu Leu Gln
290 295 300

Ala Tyr Glu Arg Ala Glu Ile Asp Pro Ser Glu Val Gln Tyr Val Glu
305 310 315 320

Leu His Gly Thr Gly Thr Arg Leu Gly Asp Pro Thr Glu Ala His Ser
325 330 335

Leu His Ser Val Phe Gly Thr Ser Thr Val Pro Arg Ser Pro Leu Leu
340 345 350

Val Gly Ser Ile Lys Thr Asn Ile Gly His Leu Glu Gly Ala Ala Gly
355 360 365

Ile Leu Gly Leu Ile Lys Thr Ala Leu Ala Val His His Arg Gln Leu
370 375 380

Pro Pro Ser Leu Asn Tyr Thr Val Pro Asn Pro Lys Ile Pro Leu Glu
385 390 395 400

Gln Leu Gly Leu Arg Val Gln Thr Thr Leu Ser Glu Trp Pro Asp Leu
405 410 415

Asp Lys Pro Leu Thr Ala Gly Val Ser Ser Phe Ser Met Gly Gly Thr
420 425 430

Asn Ala His Leu Ile Leu Gln Gln Pro Pro Thr Pro Asp Thr Thr Gln
435 440 445

Thr Pro Asn Pro Thr Thr Gly Ser Asp Pro Ala Val Gly Ser Asp Pro
450 455 460

Ala Val Gly Val Leu Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly
465 470 475 480

Leu Ser Ala Gln Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro
485 490 495

Asp Leu Asp Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser
500 505 510

His His Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His Ser
515 520 525

Glu Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His Ala Leu
530 535 540

Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu Leu Thr Pro
545 550 555 560

Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly Gln Gly Ser Gln
565 570 575

Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln Phe Pro Val Phe Ala
580 585 590

His Ala Leu Asp Glu Val Ala Ala Leu Asn Pro His Leu Asp Val
595 600 605

Ala Leu Leu Glu Val Met Phe Ser Gln Gln Asp Thr Ala Met Ala Gln
610 615 620

Leu Leu Asp Gln Thr Phe Tyr Ala Gln Pro Ala Leu Phe Ala Leu Gly
625 630 635 640

Thr Ala Leu His Arg Leu Phe Thr His Ala Gly Ile His Pro Asp Tyr
645 650 655

Leu Leu Gly His Ser Ile Gly Glu Leu Thr Ala Ala Tyr Ala Ala Gly
660 665 670

Val Leu Ser Leu Gln Asp Ala Ala Thr Leu Val Thr Ser Arg Gly Arg
675 680 685

Leu Met Gln Ser Cys Thr Pro Gly Gly Thr Met Leu Ala Leu Gln Ala
 690 695 700

Ser Glu Ala Glu Val Gln Pro Leu Leu Glu Gly Leu Asp His Ala Val
 705 710 715 720

Ser Ile Ala Ala Ile Asn Gly Ala Thr Ser Ile Val Leu Ser Gly Asp
 725 730 735

His Asp Ser Leu Glu Gln Ile Gly Glu His Phe Ile Thr Gln Asp Arg
 740 745 750

Arg Thr Thr Arg Leu Gln Val Ser His Ala Phe His Ser Pro His Met
 755 760 765

Asp Pro Ile Leu Glu Gln Phe Arg Gln Ile Ala Ala Gln Leu Thr Phe
 770 775 780

Ser Ala Pro Thr Leu Pro Ile Leu Ser Asn Leu Thr Gly Gln Ile Ala
 785 790 795 800

Arg His Asp Gln Leu Ala Ser Pro Asp Tyr Trp Thr Gln Gln Leu Arg
 805 810 815

Asn Thr Val Arg Phe His Asp Thr Val Ala Ala Leu Leu Gly Ala Gly
 820 825 830

Glu Gln Val Phe Leu Glu Leu Ser Pro His Pro Val Leu Thr Gln Ala
 835 840 845

Ile Thr Asp Thr Val Glu Gln Ala Gly Gly Gly Ala Ala Val Pro
 850 855 860

Ala Leu Arg Lys Asp Arg Pro Asp Ala Val Ala Phe Ala Ala Ala Leu
 865 870 875 880

Gly Gln Leu His Cys His Gly Ile Ser Pro Ser Trp Asn Val Leu Tyr
 885 890 895

Cys Gln Ala Arg Pro Leu Thr Leu Pro Thr Tyr Ala Phe Gln His Gln
 900 905 910

Arg Tyr Trp Leu Leu Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr
 915 920 925

His Ala Met His Pro Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn

930

935

940

Arg Gly Trp Val Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp
 945 950 955 960

Leu Asn Glu His Ala Val Glu Ser Ala Val Leu Phe Pro Asn Thr Gly
 965 970 975

Phe Val Glu Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser
 980 985 990

Val Asn Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly His Asp
 995 1000 1005

Thr Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met Gly
 1010 1015 1020

Arg Gln Ser Leu Asn Ile His Ser His Pro His Ile Gly His Asp
 1025 1030 1035

Asn Thr Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His Ala
 1040 1045 1050

Ser Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu Pro
 1055 1060 1065

Leu Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile Glu
 1070 1075 1080

Val Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn Tyr
 1085 1090 1095

Gly Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His Ala
 1100 1105 1110

Thr Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp Thr
 1115 1120 1125

Asp Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala Ala
 1130 1135 1140

Leu His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp Thr
 1145 1150 1155

Asp Asp Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg Leu Pro
 1160 1165 1170

Tyr Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr Arg
1175 1180 1185

Leu Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr Val
1190 1195 1200

His Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp Ser
1205 1210 1215

Leu Ile Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala Pro Ala
1220 1225 1230

Thr Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His Pro
1235 1240 1245

Asp Thr Thr Thr Asp Thr Asp Thr Asp Thr Asp Ala Leu Arg Tyr
1250 1255 1260

Gln Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu His
1265 1270 1275

Asp Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Glu Ala
1280 1285 1290

Asp Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu Leu
1295 1300 1305

Gln Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile His
1310 1315 1320

Thr Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu Thr
1325 1330 1335

His Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg His
1340 1345 1350

Gly Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala His
1355 1360 1365

Ala Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His Pro
1370 1375 1380

Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser Asp
1385 1390 1395

Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln Leu
1400 1405 1410

Ala Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg His
1415 1420 1425

Ser Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp Pro Glu
1430 1435 1440

Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala Leu
1445 1450 1455

Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His Leu Leu
1460 1465 1470

Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp Leu
1475 1480 1485

Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr Ala
1490 1495 1500

Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn Ser
1505 1510 1515

Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala Ala
1520 1525 1530

Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln Leu
1535 1540 1545

Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu His
1550 1555 1560

Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe Ser
1565 1570 1575

Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr Ala
1580 1585 1590

Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His Arg
1595 1600 1605

Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln Thr
1610 1615 1620

His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala Arg
1625 1630 1635

Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly Leu
1640 1645 1650

Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser Ile
1655 1660 1665

Pro Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg Asp
1670 1675 1680

Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro Arg
1685 1690 1695

Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu Asn
1700 1705 1710

Gly Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Ala Thr Leu Val
1715 1720 1725

Ala Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu Ser
1730 1735 1740

Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser Leu
1745 1750 1755

Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly Leu
1760 1765 1770

Asn Leu Ser Ser Thr Leu Ile Phe Asp His Pro Thr Pro His Ala
1775 1780 1785

Val Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile Gly Ala Leu
1790 1795 1800

Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu Glu Pro
1805 1810 1815

Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly Val Ala
1820 1825 1830

Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg Asp Val
1835 1840 1845

Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu
 1850 1855 1860

Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr
 1865 1870 1875

Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe
 1880 1885 1890

Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg
 1895 1900 1905

Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile
 1910 1915 1920

Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Val Gly
 1925 1930 1935

Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp Ala Glu
 1940 1945 1950

Gly Tyr Ala Met Thr Gly Gly Ala Thr Ser Val Met Ser Gly Arg
 1955 1960 1965

Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr Val Asp
 1970 1975 1980

Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala Cys Gln
 1985 1990 1995

Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly Val
 2000 2005 2010

Thr Val Met Ser Thr Pro Ala Val Phe Thr Glu Phe Ser Arg Gln
 2015 2020 2025

Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala Thr
 2030 2035 2040

Ala Asp Gly Thr Gly Trp Gly Glu Gly Ala Ala Val Leu Val Leu
 2045 2050 2055

Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val Leu Ala
 2060 2065 2070

Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly
2075 2080 2085

Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn Gln
2090 2095 2100

Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala Val
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Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala
2120 2125 2130

Ser Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp Gln
2135 2140 2145

Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln
2150 2155 2160

Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile
2165 2170 2175

Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser
2180 2185 2190

Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr Glu
2195 2200 2205

Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala Val
2210 2215 2220

Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile Leu Gln
2225 2230 2235

Gln Pro Pro Thr Pro Asn Pro Thr Gln Thr Pro Glu Asp Cys Ser
2240 2245 2250

Pro Ala Gln Ser Pro Cys Ala Thr Ile Thr Asp Ala Gly Thr Gly
2255 2260 2265

Leu Ser Phe Val Pro Trp Val Ile Ser Ala Lys Ser Ala Glu Ala
2270 2275 2280

Leu Ser Ala Gln Ala Ser Arg Leu Leu Thr Arg Leu Asp Asp Asp
2285 2290 2295

Pro Val Val Asp Ala Ile Asp Leu Gly Trp Ser Leu Ile Ala Thr.
2300 2305 2310

Arg Ser Met Phe Glu His Arg Ala Val Val Val Gly Ala Asp Arg
2315 2320 2325

His Gln Leu Gln Arg Gly Leu Ala Glu Leu Ala Ser Gly Asn Leu
2330 2335 2340

Gly Ala Asp Val Val Val Gly Arg Ala Arg Ala Ala Gly Glu Thr
2345 2350 2355

Val Met Val Phe Pro Gly Gln Gly Ser Gln Arg Leu Gly Met Gly
2360 2365 2370

Ala Gln Leu Tyr Glu Gln Phe Pro Val Phe Ala Ala Ala Phe Asp
2375 2380 2385

Asp Val Val Asp Ala Leu Asp Gln Tyr Leu Arg Leu Pro Leu Arg
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Gln Val Met Trp Gly Asp Asp Glu Gly Leu Leu Asn Ser Thr Glu
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Phe Ala Gln Pro Ser Leu Phe Ala Val Glu Val Ala Leu Phe Ala
2420 2425 2430

Leu Leu Arg Phe Trp Gly Val Val Pro Asp Tyr Val Ile Gly His
2435 2440 2445

Ser Val Gly Glu Leu Ala Ala Ala Gln Val Ala Gly Val Leu Ser
2450 2455 2460

Leu Gln Asp Ala Ala Lys Leu Val Ser Ala Arg Gly Arg Leu Met
2465 2470 2475

Gln Ala Leu Pro Ala Gly Gly Ala Met Val Ala Val Ala Ala Ser
2480 2485 2490

Gln His Glu Val Glu Pro Leu Leu Val Glu Gly Val Asp Ile Ala
2495 2500 2505

Ala Leu Asn Ala Pro Gly Ser Val Val Ile Ser Gly Asp Gln Ala
2510 2515 2520

Ala Val Arg Leu Ile Ala Asn Arg Leu Ala Asp Arg Gly Tyr Arg
2525 2530 2535

Ala His Glu Leu Ala Val Ser His Ala Phe His Ser Ser Leu Met
2540 2545 2550

Glu Pro Met Leu Glu Glu Phe Ala Arg Leu Ala Ser Glu Ile Val
2555 2560 2565

Val Glu Gln Pro Gln Ile Pro Leu Ile Ser Asn Val Thr Gly Gln
2570 2575 2580

Leu Ala Asn Ala Asp Tyr Gly Ser Ala Gly Tyr Trp Val Asp His
2585 2590 2595

Ile Arg Arg Pro Val Arg Phe Ala Asp Ser Val Ala Ser Leu Glu
2600 2605 2610

Ala Met Gly Ala Ser Cys Phe Ile Glu Val Gly Pro Ala Ser Gly
2615 2620 2625

Leu Gly Ala Ala Ile Glu Gln Ser Leu Lys Ser Ala Glu Pro Thr
2630 2635 2640

Val Ser Val Ser Ala Leu Ser Thr Asp Lys Pro Glu Ser Val Ala
2645 2650 2655

Val Leu Arg Ala Ala Ala Arg Leu Ser Thr Ser Gly Ile Pro Val
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Asp Trp Gln Ser Val Phe Asp Gly Arg Ser Thr Gln Thr Val Asn
2675 2680 2685

Leu Pro Thr Tyr Ala Phe Gln Arg Gln Arg Phe Trp Leu Asp Ala
2690 2695 2700

Asn Arg Ile Gly Gln Gly Asp Pro Ala Ser Gln Pro Gln Ala Gln
2705 2710 2715

Asn Val Glu Ser Arg Phe Trp Glu Ala Val Glu Arg Glu Asp Val
2720 2725 2730

Asp Gly Leu Ala Asp Ser Ile Gly Val Thr Ala Ser Ala Met Gln
2735 2740 2745

Thr Val Leu Pro Ala Leu Ser Ser Trp Arg Arg Ala Glu Arg Thr

2750 2755 2760

Gln Ser Glu Leu Asp Ser Trp Arg Tyr Gln Val Thr Trp Leu Ser
2765 2770 2775

Ser Pro Ala Thr Pro Ser Ser Ile Thr Leu Ser Gly Ile Trp Leu
2780 2785 2790

Leu Ile Val Pro Ser Glu Leu Ala Lys Thr Asp Pro Val Ile Gly
2795 2800 2805

Cys Ala Ala Ala Leu Glu Ala His Gly Ala Leu Val Thr Ile Ile
2810 2815 2820

Thr Ile Phe Glu Pro Asp Phe Asn Arg Ser Leu Met Gly Ala Ser
2825 2830 2835

Leu Lys Asp Ile Gly Ser His Ile Ser Gly Val Ile Ser Phe Leu
2840 2845 2850

Gly Ile His Gly Ser Glu Phe Ser Asp Ser Gly Ala Val Lys Thr
2855 2860 2865

Leu Asn Leu Val Gln Ala Met Gly Asp Val His Leu Asp Val Pro
2870 2875 2880

Leu Trp Cys Leu Thr Gln Gly Ala Val Ser Ile Ser Ala Asp Asp
2885 2890 2895

Leu Ile Arg Cys Ser Ser Ala Ala Leu Val Trp Gly Leu Gly Arg
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Val Val Ala Leu Glu His Pro Gly Ser Trp Gly Gly Leu Val Asp
2915 2920 2925

Leu Pro Glu Ser Pro Asp Asp Ala Ala Trp Glu Arg Leu Cys Ala
2930 2935 2940

Leu Leu Ala Gln Pro Thr Asp Glu Asp Gln Phe Ala Ile Arg Pro
2945 2950 2955

Ser Gly Val Phe Leu Arg Arg Leu Ile His Ala Pro Ala Thr Thr
2960 2965 2970

Thr Ser Lys Ser Ser Thr Ala Trp Ala Pro Arg Gly Thr Val Leu
2975 2980 2985

Ile Thr Gly Gly Thr Gly Ala Leu Gly Ala His Val Ala Arg Trp
2990 2995 3000

Leu Ala His Lys Tyr Glu Ser Val Asp Leu Leu Leu Thr Ser Arg
3005 3010 3015

Arg Gly Met Ala Ala Asp Gly Ala Thr Glu Leu Val Asp Asp Leu
3020 3025 3030

Arg Thr Ala Gly Ala Ser Val Thr Val His Ala Cys Asp Val Thr
3035 3040 3045

Asp Arg Thr Ser Val Glu Ala Ala Ile Ala Gly Lys Ser Leu Asp
3050 3055 3060

Ala Val Phe His Leu Ala Gly Arg His Gln Pro Thr Leu Leu Thr
3065 3070 3075

Glu Leu Glu Asp Glu Ser Phe Ser Asp Glu Leu Ala Pro Lys Val
3080 3085 3090

His Gly Ala Gln Val Leu Ser Asp Ile Thr Ser Asn Leu Thr Leu
3095 3100 3105

Ser Ala Phe Val Met Phe Ser Ser Val Ala Gly Ile Trp Gly Gly
3110 3115 3120

Lys Ser Gln Gly Ala Tyr Ala Ala Ala Asn Ala Phe Leu Asp Ser
3125 3130 3135

Leu Ala Glu Lys Arg Arg Thr Leu Gly Leu Pro Ala Thr Ser Val
3140 3145 3150

Ala Trp Gly Leu Trp Ala Gly Gly Gly Met Gly Asp Arg Pro Ser
3155 3160 3165

Ala Ser Gly Leu Asn Leu Ile Gly Leu Lys Ser Met Ser Ala Asp
3170 3175 3180

Leu Ala Val Gln Ala Leu Ser Asp Ala Ile Asp Arg Pro Gln Ala
3185 3190 3195

Thr Leu Thr Val Ala Ser Val Asn Trp Asp Arg Phe Tyr Pro Thr
3200 3205 3210

Phe Ala Leu Ala Arg Pro Arg Pro Phe Leu His Glu Ile Thr Glu
3215 3220 3225

Val Met Ala Tyr Arg Glu Ser Met Arg Ser Ser Ser Ala Ser Thr
3230 3235 3240

Ala Thr Leu Leu Thr Ser Lys Leu Ala Gly Leu Thr Ala Thr Glu
3245 3250 3255

Gln Arg Ala Val Thr Arg Lys Leu Val Leu Asp Gln Ala Ala Ser
3260 3265 3270

Val Leu Gly Tyr Ala Ser Thr Glu Ser Leu Asp Thr His Glu Ser
3275 3280 3285

Phe Lys Asp Leu Gly Phe Asp Ser Leu Thr Ala Leu Glu Leu Arg
3290 3295 3300

Asp His Leu Gln Thr Ala Thr Gly Leu Asn Leu Ser Ser Thr Leu
3305 3310 3315

Ile Phe Asp His Pro Thr Pro His Ala Val Ala Glu His Leu Leu
3320 3325 3330

Glu Gln Ile Pro Gly Ile Gly Ala Leu Val Pro Ala Pro Val Val
3335 3340 3345

Ile Ala Ala Gly Arg Thr Glu Glu Pro Val Ala Val Val Gly Met
3350 3355 3360

Ala Cys Arg Phe Pro Gly Gly Val Ala Ser Ala Asp Gln Leu Trp
3365 3370 3375

Asp Leu Val Ile Ala Gly Arg Asp Val Val Gly Asn Phe Pro Ala
3380 3385 3390

Asp Arg Gly Trp Asp Val Glu Gly Leu Phe Asp Pro Asp Pro Asp
3395 3400 3405

Ala Val Gly Lys Thr Tyr Thr Arg Tyr Gly Ala Phe Leu Asp Asp
3410 3415 3420

Ala Ala Gly Phe Asp Ala Gly Phe Phe Gly Ile Ser Pro Arg Glu
3425 3430 3435

Ala Arg Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Val Cys
3440 3445 3450

Trp Glu Ala Leu Glu Thr Ala Gly Ile Pro Ala His Thr Leu Ala
3455 3460 3465

Gly Thr Ser Thr Gly Val Phe Val Gly Ala Trp Ala Gln Ser Tyr
3470 3475 3480

Gly Ala Thr Asn Ser Asp Asp Ala Glu Gly Tyr Ala Met Thr Gly
3485 3490 3495

Gly Ala Thr Ser Val Met Ser Gly Arg Ile Ala Tyr Thr Leu Gly
3500 3505 3510

Leu Glu Gly Pro Ala Ile Thr Val Asp Thr Ala Cys Ser Ser Ser
3515 3520 3525

Leu Val Ala Ile His Leu Ala Cys Gln Ser Leu Arg Asn Asn Glu
3530 3535 3540

Ser Gln Leu Ala Leu Ala Gly Gly Val Thr Val Met Ser Thr Pro
3545 3550 3555

Ala Val Phe Thr Glu Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp
3560 3565 3570

Gly Arg Cys Lys Ala Phe Ala Ala Thr Ala Asp Gly Thr Gly Trp
3575 3580 3585

Gly Glu Gly Ala Ala Val Leu Val Leu Glu Arg Leu Ser Glu Ala
3590 3595 3600

Arg Arg Asn Asn His Pro Val Leu Ala Ile Val Ala Gly Ser Ala
3605 3610 3615

Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro His Gly
3620 3625 3630

Pro Ser Gln Gln Arg Val Ile Asn Gln Ala Leu Ala Asn Ala Gly
3635 3640 3645

Leu Thr His Asp Gln Val Asp Ala Val Glu Ala His Gly Thr Gly
3650 3655 3660

Thr Thr Leu Gly Asp Pro Ile Glu Ala Ser Ala Leu His Ala Thr
3665 3670 3675

Tyr Gly His His His Thr Pro Asp Gln Pro Leu Trp Leu Gly Ser
3680 3685 3690

Ile Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala Gly Ala Ala
3695 3700 3705

Gly Val Val Lys Met Ile Gln Ala Ile Thr His Ala Thr Leu Pro
3710 3715 3720

Ala Thr Leu His Val Asp Gln Pro Ser Pro His Ile Asp Trp Ser
3725 3730 3735

Ser Gly Thr Val Arg Leu Leu Thr Glu Pro Ile Gln Trp Pro Asn
3740 3745 3750

Thr Asp His Pro Arg Thr Ala Ala Val Ser Ser Phe Gly Ile Ser
3755 3760 3765

Gly Thr Asn Ala His Leu Ile Leu Gln Gln Pro Pro Thr Pro Asn
3770 3775 3780

Pro Thr Gln Thr Pro Glu Asp Cys Ser Pro Ala Gln Ser Pro Cys
3785 3790 3795

Ala Thr Ile Thr Asp Ala Gly Thr Gly Leu Ser Phe Val Pro Trp
3800 3805 3810

Val Ile Ser Ala Lys Ser Ala Glu Ala Leu Ser Ala Gln Ala Ser
3815 3820 3825

Arg Leu Leu Thr Arg Leu Asp Asp Asp Pro Val Val Asp Ala Ile
3830 3835 3840

Asp Leu Gly Trp Ser Leu Ile Ala Thr Arg Ser Met Phe Glu His
3845 3850 3855

Arg Ala Val Val Val Gly Ala Asp Arg His Gln Leu Gln Arg Gly
3860 3865 3870

Leu Ala Glu Leu Ala Ser Gly Asn Leu Gly Ala Asp Val Val Val
3875 3880 3885

Gly Arg Ala Arg Ala Ala Gly Glu Thr Val Met Val Phe Pro Gly
3890 3895 3900

Gln Gly Ser Gln Arg Leu Gly Met Gly Ala Gln Leu Tyr Glu Gln
3905 3910 3915

Phe Pro Val Phe Ala Ala Ala Phe Asp Asp Val Val Asp Ala Leu
3920 3925 3930

Asp Gln Tyr Leu Arg Leu Pro Leu Arg Gln Val Met Trp Gly Asp
3935 3940 3945

Asp Glu Gly Leu Leu Asn Ser Thr Glu Phe Ala Gln Pro Ser Leu
3950 3955 3960

Phe Ala Val Glu Val Ala Leu Phe Ala Leu Leu Arg Phe Trp Gly
3965 3970 3975

Val Val Pro Asp Tyr Val Ile Gly His Ser Val Gly Glu Leu Ala
3980 3985 3990

Ala Ala Gln Val Ala Gly Val Leu Ser Leu Gln Asp Ala Ala Lys
3995 4000 4005

Leu Val Ser Ala Arg Gly Arg Leu Met Gln Ala Leu Pro Ala Gly
4010 4015 4020

Gly Ala Met Val Ala Val Ala Ala Ser Gln His Glu Val Glu Pro
4025 4030 4035

Leu Leu Val Glu Gly Val Asp Ile Ala Ala Leu Asn Ala Pro Gly
4040 4045 4050

Ser Val Val Ile Ser Gly Asp Gln Ala Ala Val Arg Leu Ile Ala
4055 4060 4065

Asn Arg Leu Ala Asp Arg Gly Tyr Arg Ala His Glu Leu Ala Val
4070 4075 4080

Ser His Ala Phe His Ser Ser Leu Met Glu Pro Met Leu Glu Glu
4085 4090 4095

Phe Ala Arg Leu Ala Ser Glu Ile Val Val Glu Gln Pro Gln Ile
4100 4105 4110

Pro Leu Ile Ser Asn Val Thr Gly Gln Leu Ala Asn Ala Asp Tyr
4115 4120 4125

Gly Ser Ala Gly Tyr Trp Val Asp His Ile Arg Arg Pro Val Arg
4130 4135 4140

Phe Ala Asp Ser Val Ala Ser Leu Glu Ala Met Gly Ala Ser Cys
4145 4150 4155

Phe Ile Glu Val Gly Pro Ala Ser Gly Leu Gly Ala Ala Ile Glu
4160 4165 4170

Gln Ser Leu Lys Ser Ala Glu Pro Thr Val Ser Val Ser Ala Leu
4175 4180 4185

Ser Thr Asp Lys Pro Glu Ser Val Ala Val Leu Arg Ala Ala Ala
4190 4195 4200

Arg Leu Ser Thr Ser Gly Ile Pro Val Asp Trp Gln Ser Val Phe
4205 4210 4215

Asp Gly Arg Ser Thr Gln Thr Val Asn Leu Pro Thr Tyr Ala Phe
4220 4225 4230

Gln Arg Gln Arg Phe Trp Leu Asp Ala Asn Arg Ile Gly Gln Gly
4235 4240 4245

Asp Pro Ala Ser Gln Pro Gln Ala Gln Asn Val Glu Ser Arg Phe
4250 4255 4260

Trp Glu Ala Val Glu Arg Glu Asp Val Asp Gly Leu Ala Asp Ser
4265 4270 4275

Ile Gly Val Thr Ala Ser Ala Met Gln Thr Val Leu Pro Ala Leu
4280 4285 4290

Ser Ser Trp Arg Arg Ala Glu Arg Thr Gln Ser Glu Leu Asp Ser
4295 4300 4305

Trp Arg Tyr Gln Val Thr Trp Leu Ser Ser Pro Ala Thr Pro Ser
4310 4315 4320

Ser Ile Thr Leu Ser Gly Ile Trp Leu Leu Ile Val Pro Ser Glu
4325 4330 4335

Leu Ala Lys Thr Asp Pro Val Ile Gly Cys Ala Ala Ala Leu Glu

4340 4345 4350

Ala His Gly Ala Leu Val Thr Ile Ile Thr Ile Phe Glu Pro Asp
4355 4360 4365

Phe Asn Arg Ser Leu Met Gly Ala Ser Leu Lys Asp Ile Gly Ser
4370 4375 4380

His Ile Ser Gly Val Ile Ser Phe Leu Gly Ile His Gly Ser Glu
4385 4390 4395

Phe Ser Asp Ser Gly Ala Val Lys Thr Leu Asn Leu Val Gln Ala
4400 4405 4410

Met Gly Asp Val His Leu Asp Val Pro Leu Trp Cys Leu Thr Gln
4415 4420 4425

Gly Ala Val Ser Ile Ser Ala Asp Asp Leu Ile Arg Cys Ser Ser
4430 4435 4440

Ala Ala Leu Val Trp Gly Leu Gly Arg Val Val Ala Leu Glu His
4445 4450 4455

Pro Gly Ser Trp Gly Gly Leu Val Asp Leu Pro Glu Ser Pro Asp
4460 4465 4470

Asp Ala Ala Trp Glu Arg Leu Cys Ala Leu Leu Ala Gln Pro Thr
4475 4480 4485

Asp Glu Asp Gln Phe Ala Ile Arg Pro Ser Gly Val Phe Leu Arg
4490 4495 4500

Arg Leu Ile His Ala Pro Ala Thr Thr Thr Ser Lys Ser Ser Thr
4505 4510 4515

Ala Trp Ala Pro Arg Gly Thr Val Leu Ile Thr Gly Gly Thr Gly
4520 4525 4530

Ala Leu Gly Ala His Val Ala Arg Trp Leu Ala His Lys Tyr Glu
4535 4540 4545

Ser Val Asp Leu Leu Leu Thr Ser Arg Arg Gly Met Ala Ala Asp
4550 4555 4560

Gly Ala Thr Glu Leu Val Asp Asp Leu Arg Thr Ala Gly Ala Ser
4565 4570 4575

Val Thr Val His Ala Cys Asp Val Thr Asp Arg Thr Ser Val Glu
4580 4585 4590

Ala Ala Ile Ala Gly Lys Ser Leu Asp Ala Val Phe His Leu Ala
4595 4600 4605

Gly Arg His Gln Pro Thr Leu Leu Thr Glu Leu Glu Asp Glu Ser
4610 4615 4620

Phe Ser Asp Glu Leu Ala Pro Lys Val His Gly Ala Gln Val Leu
4625 4630 4635

Ser Asp Ile Thr Ser Asn Leu Thr Leu Ser Ala Phe Val Met Phe
4640 4645 4650

Ser Ser Val Ala Gly Ile Trp Gly Gly Lys Ser Gln Gly Ala Tyr
4655 4660 4665

Ala Ala Ala Asn Ala Phe Leu Asp Ser Leu Ala Glu Lys Arg Arg
4670 4675 4680

Thr Leu Gly Leu Pro Ala Thr Ser Val Ala Trp Gly Leu Trp Ala
4685 4690 4695

Gly Gly Gly Met Gly Asp Arg Pro Ser Ala Ser Gly Leu Asn Leu
4700 4705 4710

Ile Gly Leu Lys Ser Met Ser Ala Asp Leu Ala Val Gln Ala Leu
4715 4720 4725

Ser Asp Ala Ile Asp Arg Pro Gln Ala Thr Leu Thr Val Ala Ser
4730 4735 4740

Val Asn Trp Asp Arg Phe Tyr Pro Thr Phe Ala Leu Ala Arg Pro
4745 4750 4755

Arg Pro Phe Leu His Glu Ile Thr Glu Val Met Ala Tyr Arg Glu
4760 4765 4770

Ser Met Arg Ser Ser Ala Ser Thr Ala Thr Leu Leu Thr Ser
4775 4780 4785

Lys Leu Ala Gly Leu Thr Ala Thr Glu Gln Arg Ala Val Thr Arg
4790 4795 4800

Lys Leu Val Leu Asp Gln Ala Ala Ser Val Leu Gly Tyr Ala Ser
4805 4810 4815

Thr Glu Ser Leu Asp Thr His Glu Ser Phe Lys Asp Leu Gly Phe
4820 4825 4830

Asp Ser Leu Thr Ala Leu Glu Leu Arg Asp His Leu Gln Thr Ala
4835 4840 4845

Thr Gly Leu Asn Leu Ser Ser Thr Leu Ile Phe Asp His Pro Thr
4850 4855 4860

Pro His Ala Val Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile
4865 4870 4875

Gly Ala Leu Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr
4880 4885 4890

Glu Glu Pro Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly
4895 4900 4905

Gly Val Ala Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly
4910 4915 4920

Arg Asp Val Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val
4925 4930 4935

Glu Gly Leu Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr
4940 4945 4950

Thr Arg Tyr Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala
4955 4960 4965

Gly Phe Phe Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro
4970 4975 4980

Gln Gln Arg Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr
4985 4990 4995

Ala Gly Ile Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val
5000 5005 5010

Phe Val Gly Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp
5015 5020 5025

Asp Ala Glu Gly Tyr Ala Met Thr Gly Gly Ala Ile Ser Val Met
5030 5035 5040

Ser Gly Arg Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile
5045 5050 5055

Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu
5060 5065 5070

Ala Cys Gln Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Thr
5075 5080 5085

Gly Gly Val Thr Val Met Ser Thr Pro Ala Ile Phe Thr Glu Phe
5090 5095 5100

Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe
5105 5110 5115

Ala Ala Thr Ala Asp Gly Thr Gly Trp Gly Glu Gly Ala Ala Val
5120 5125 5130

Leu Val Leu Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro
5135 5140 5145

Val Leu Ala Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala
5150 5155 5160

Ser Asn Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val
5165 5170 5175

Ile Asn Gln Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val
5180 5185 5190

Asp Ala Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro
5195 5200 5205

Ile Glu Ala Ser Ala Leu His Ala Thr Tyr Gly His His His Thr
5210 5215 5220

Pro Asp Gln Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly
5225 5230 5235

His Thr Gln Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile
5240 5245 5250

Gln Ala Ile Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp

5255 5260 5265

Gln Pro Ser Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu
5270 5275 5280

Leu Thr Glu Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr
5285 5290 5295

Ala Ala Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu
5300 5305 5310

Ile Leu Gln Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn
5315 5320 5325

Thr Thr Thr Gly Ser Asp Pro Ala Val Gly Ser Asp Pro Ala Val
5330 5335 5340

Gly Val Leu Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu
5345 5350 5355

Ser Ala Gln Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro
5360 5365 5370

Asp Leu Asp Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg
5375 5380 5385

Ser His His Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His
5390 5395 5400

His Ser Glu Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu
5405 5410 5415

His Ala Leu Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly
5420 5425 5430

Leu Leu Thr Pro Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro
5435 5440 5445

Gly Gln Gly Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg
5450 5455 5460

Gln Phe Pro Val Phe Ala His Ala Leu Asp Ala Cys Asp Ala Ala
5465 5470 5475

Leu Gln Pro Phe Thr Gly Trp Ser Val Leu Ala Val Leu His Asp

5480

5485

5490

Glu Pro Glu Ala Pro Ser Leu Glu Arg Val Asp Val Val Gln Pro
5495 5500 5505

Val Leu Phe Ser Val Met Val Ser Leu Ala Ala Leu Trp Arg Trp
5510 5515 5520

Ala Gly Ile Thr Pro Asp Ala Val Ile Gly His Ser Gln Gly Glu
5525 5530 5535

Ile Ala Ala Ala His Val Ala Gly Ala Leu Thr Leu Pro Glu Ala
5540 5545 5550

Ala Ala Val Val Ala Leu Arg Ser Arg Val Leu Thr Asp Leu Ala
5555 5560 5565

Gly Ala Gly Ala Met Ala Ser Val Leu Ser Pro Glu Glu Pro Leu
5570 5575 5580

Thr Gln Leu Leu Ala Arg Trp Asp Gly Lys Ile Thr Val Ala Ala
5585 5590 5595

Val Asn Gly Pro Ala Ser Ala Val Val Ser Gly Asp Thr Thr Ala
5600 5605 5610

Ile Thr Glu Leu Leu Ile Thr Cys Glu His Glu Asn Ile Asp Ala
5615 5620 5625

Arg Ala Ile Pro Val Asp Tyr Pro Ser His Ser Pro Tyr Met Glu
5630 5635 5640

His Ile Arg His Gln Phe Leu Asp Glu Leu Pro Glu Leu Thr Pro
5645 5650 5655

Arg Pro Ser Thr Ile Ala Met Tyr Ser Thr Val Asp Gly Glu Pro
5660 5665 5670

His Asp Thr Ala Tyr Asp Thr Thr Thr Met Thr Ala Asp Tyr Trp
5675 5680 5685

Tyr Arg Asn Ile Arg Asn Thr Val Arg Phe His Asp Thr Val Ala
5690 5695 5700

Ala Leu Leu Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro

5705

5710

5715

His Pro Val Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala
5720 5725 5730

Gly Gly Gly Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro
5735 5740 5745

Asp Ala Val Ala Phe Ala Ala Ala Leu Gly Gln Leu His Cys His
5750 5755 5760

Gly Ile Ser Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro
5765 5770 5775

Leu Thr Leu Pro Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu
5780 5785 5790

Leu Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met
5795 5800 5805

His Pro Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly
5810 5815 5820

Trp Val Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu
5825 5830 5835

Asn Glu His Ala Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly
5840 5845 5850

Phe Val Glu Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser
5855 5860 5865

Ser Val Asn Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly
5870 5875 5880

His Asp Thr Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp
5885 5890 5895

Met Gly Arg Gln Ser Leu Asn Ile His Ser Arg Pro His Ile Gly
5900 5905 5910

His Asp Asn Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu
5915 5920 5925

His Ala Ser Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His

5930	5935	5940
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Leu Pro Leu Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala
5945 5950 5955

Ile Glu Val Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr
5960 5965 5970

Asn Tyr Gly Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp
5975 5980 5985

His Ala Thr Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu
5990 5995 6000

Asp Thr Asp Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp
6005 6010 6015

Ala Ala Leu His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn
6020 6025 6030

Asp Thr Asp Asp Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg
6035 6040 6045

Leu Pro Tyr Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala
6050 6055 6060

Thr Arg Leu Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile
6065 6070 6075

Thr Val His Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile
6080 6085 6090

Asp Ser Leu Ile Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala
6095 6100 6105

Pro Ala Thr Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro
6110 6115 6120

His Pro Asp Thr Thr Thr Asp Thr Asp Thr Asp Thr Asp Ala Leu
6125 6130 6135

Arg Tyr Gln Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr
6140 6145 6150

Leu His Asp Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Thr
6155 6160 6165

Glu Ala Asp Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu
6170 6175 6180

Glu Leu Gln Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg
6185 6190 6195

Ile His Thr Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp
6200 6205 6210

Leu Thr His Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr
6215 6220 6225

Arg His Gly Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu
6230 6235 6240

Ala His Ala Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu
6245 6250 6255

His Pro Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn
6260 6265 6270

Ser Asp Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn
6275 6280 6285

Gln Leu Ala Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr
6290 6295 6300

Arg His Ser Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp
6305 6310 6315

Pro Glu Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly
6320 6325 6330

Ala Leu Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His
6335 6340 6345

Leu Leu Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr
6350 6355 6360

Asp Leu Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile
6365 6370 6375

Thr Ala Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val
6380 6385 6390

Asn Ser Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr
6395 6400 6405

Ala Ala Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp
6410 6415 6420

Gln Leu Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln
6425 6430 6435

Leu His Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met
6440 6445 6450

Phe Ser Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn
6455 6460 6465

Tyr Ala Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg
6470 6475 6480

His Arg Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp
6485 6490 6495

Gln Thr His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu
6500 6505 6510

Ala Arg Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His
6515 6520 6525

Gly Leu Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val
6530 6535 6540

Ser Ile Pro Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala
6545 6550 6555

Arg Asp Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr
6560 6565 6570

Pro Arg Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg
6575 6580 6585

Leu Asn Gly Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr
6590 6595 6600

Leu Val Ala Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro
6605 6610 6615

Glu Ser Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp
6620 6625 6630

Ser Leu Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr
6635 6640 6645

Gly Leu Asp Leu Pro Pro Thr Leu Ile Phe Asp His Pro Thr Pro
6650 6655 6660

His Ala Val Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile Gly
6665 6670 6675

Ala Leu Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu
6680 6685 6690

Glu Pro Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly
6695 6700 6705

Val Ala Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg
6710 6715 6720

Asp Val Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu
6725 6730 6735

Gly Leu Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr
6740 6745 6750

Arg Tyr Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly
6755 6760 6765

Phe Phe Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln
6770 6775 6780

Gln Arg Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala
6785 6790 6795

Gly Ile Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe
6800 6805 6810

Ala Gly Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp
6815 6820 6825

Ala Glu Gly Tyr Ala Met Thr Gly Gly Ser Thr Ser Val Met Ser
6830 6835 6840

Gly Arg Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr

6845 6850 6855

Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala
6860 6865 6870

Cys Gln Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly
6875 6880 6885

Gly Val Thr Val Met Ser Thr Pro Ala Val Phe Thr Glu Phe Ser
6890 6895 6900

Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala
6905 6910 6915

Ala Thr Ala Asp Gly Thr Gly Phe Gly Glu Gly Ala Ala Val Leu
6920 6925 6930

Val Leu Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val
6935 6940 6945

Leu Ala Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser
6950 6955 6960

Asn Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile
6965 6970 6975

Asn Gln Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp
6980 6985 6990

Ala Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile
6995 7000 7005

Glu Ala Ser Ala Leu His Ala Thr Tyr Gly His His His Thr Pro
7010 7015 7020

Asp Gln Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His
7025 7030 7035

Thr Gln Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln
7040 7045 7050

Ala Ile Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln
7055 7060 7065

Pro Ser Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu
7070 7075 7080

Thr Glu Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala
7085 7090 7095

Ala Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile
7100 7105 7110

Leu Gln Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn Pro
7115 7120 7125

Thr Thr Gly Ser Asp Pro Ala Val Gly Ser Asp Pro Ala Val Gly
7130 7135 7140

Val Leu Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu Ser
7145 7150 7155

Ala Gln Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro Asp
7160 7165 7170

Leu Asp Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser
7175 7180 7185

His His Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His
7190 7195 7200

Ser Glu Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His
7205 7210 7215

Ala Leu Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu
7220 7225 7230

Leu Thr Pro Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly
7235 7240 7245

Gln Gly Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln
7250 7255 7260

Phe Pro Val Phe Ala His Ala Leu Asp Glu Val Ala Ala Ala Leu
7265 7270 7275

Asn Pro His Leu Asp Val Ala Leu Leu Glu Val Met Phe Ser Gln
7280 7285 7290

Gln Asp Thr Ala Met Ala Gln Leu Leu Asp Gln Thr Phe Tyr Ala
7295 7300 7305

Gln Pro Ala Leu Phe Ala Leu Gly Thr Ala Leu His Arg Leu Phe
 7310 7315 7320

Thr His Ala Gly Ile His Pro Asp Tyr Leu Leu Gly His Ser Ile
 7325 7330 7335

Gly Glu Leu Thr Ala Ala Tyr Ala Ala Gly Val Leu Ser Leu Gln
 7340 7345 7350

Asp Ala Ala Thr Leu Val Thr Ser Arg Gly Arg Leu Met Gln Ser
 7355 7360 7365

Cys Thr Pro Gly Gly Thr Met Leu Ala Leu Gln Ala Ser Glu Ala
 7370 7375 7380

Glu Val Gln Pro Leu Leu Glu Gly Leu Asp His Ala Val Ser Ile
 7385 7390 7395

Ala Ala Ile Asn Gly Ala Thr Ser Ile Val Leu Ser Gly Asp His
 7400 7405 7410

Asp Ser Leu Glu Gln Ile Gly Glu His Phe Ile Thr Gln Asp Arg
 7415 7420 7425

Arg Thr Thr Arg Leu Gln Val Ser His Ala Phe His Ser Pro His
 7430 7435 7440

Met Asp Pro Ile Leu Glu Gln Phe Arg Gln Ile Ala Ala Gln Leu
 7445 7450 7455

Thr Phe Ser Ala Pro Thr Leu Pro Ile Leu Ser Asn Leu Thr Gly
 7460 7465 7470

Gln Ile Ala Arg His Asp Gln Leu Ala Ser Pro Asp Tyr Trp Thr
 7475 7480 7485

Gln Gln Leu Arg Asn Thr Val Arg Phe His Asp Thr Val Ala Ala
 7490 7495 7500

Leu Leu Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro His
 7505 7510 7515

Pro Val Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly
 7520 7525 7530

Gly Gly Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp
7535 7540 7545

Ala Val Ala Phe Ala Ala Leu Gly Gln Leu His Cys His Gly
7550 7555 7560

Ile Ser Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu
7565 7570 7575

Thr Leu Pro Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu
7580 7585 7590

Pro Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met His
7595 7600 7605

Pro Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp
7610 7615 7620

Val Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu Asn
7625 7630 7635

Glu His Ala Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly Phe
7640 7645 7650

Val Glu Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser
7655 7660 7665

Val Asn Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly His
7670 7675 7680

Asp Thr Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met
7685 7690 7695

Gly Arg Gln Ser Leu Asn Ile His Ser Arg Pro His Ile Gly His
7700 7705 7710

Asp Asn Thr Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His
7715 7720 7725

Ala Ser Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu
7730 7735 7740

Pro Leu Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile
7745 7750 7755

Glu Val Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn
 7760 7765 7770

Tyr Gly Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His
 7775 7780 7785

Ala Thr Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp
 7790 7795 7800

Thr Asp Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala
 7805 7810 7815

Ala Leu His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp
 7820 7825 7830

Thr Asp Asp Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg Leu
 7835 7840 7845

Pro Tyr Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr
 7850 7855 7860

Arg Leu Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr
 7865 7870 7875

Val His Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp
 7880 7885 7890

Ser Leu Ile Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala Pro
 7895 7900 7905

Ala Thr Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His
 7910 7915 7920

Pro Asp Thr Thr Asp Thr Asp Thr Asp Thr Asp Ala Leu Arg
 7925 7930 7935

Tyr Gln Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu
 7940 7945 7950

His Asp Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Thr Glu
 7955 7960 7965

Ala Asp Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu
 7970 7975 7980

Leu Gln Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile
7985 7990 7995

His Thr Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu
8000 8005 8010

Thr His Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg
8015 8020 8025

His Gly Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala
8030 8035 8040

His Ala Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His
8045 8050 8055

Pro Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser
8060 8065 8070

Asp Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln
8075 8080 8085

Leu Ala Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg
8090 8095 8100

His Ser Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp Pro
8105 8110 8115

Glu Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala
8120 8125 8130

Leu Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His Leu
8135 8140 8145

Leu Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp
8150 8155 8160

Leu Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr
8165 8170 8175

Ala Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn
8180 8185 8190

Ser Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala
8195 8200 8205

Ala Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln
 8210 8215 8220

Leu Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu
 8225 8230 8235

His Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe
 8240 8245 8250

Ser Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr
 8255 8260 8265

Ala Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His
 8270 8275 8280

Arg Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln
 8285 8290 8295

Thr His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala
 8300 8305 8310

Arg Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly
 8315 8320 8325

Leu Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser
 8330 8335 8340

Ile Pro Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg
 8345 8350 8355

Asp Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro
 8360 8365 8370

Arg Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu
 8375 8380 8385

Asn Gly Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr Leu
 8390 8395 8400

Val Ala Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu
 8405 8410 8415

Ser Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser
 8420 8425 8430

Leu Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly

8435	8440	8445
Leu Asp Leu Pro Pro Thr Leu Ile Phe Asp His Pro Thr Pro His		
8450	8455	8460
Ala Val Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile Gly Ala		
8465	8470	8475
Leu Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu Glu		
8480	8485	8490
Pro Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly Val		
8495	8500	8505
Ala Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg Asp		
8510	8515	8520
Val Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly		
8525	8530	8535
Leu Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg		
8540	8545	8550
Tyr Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe		
8555	8560	8565
Phe Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln		
8570	8575	8580
Arg Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly		
8585	8590	8595
Ile Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Ala		
8600	8605	8610
Gly Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp Ala		
8615	8620	8625
Glu Gly Tyr Ala Met Thr Gly Gly Ala Thr Ser Val Met Ser Gly		
8630	8635	8640
Arg Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr Val		
8645	8650	8655
Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala Cys		
8660	8665	8670

Gln Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly
8675 8680 8685

Val Thr Val Met Ser Thr Pro Ala Val Phe Thr Glu Phe Ser Arg
8690 8695 8700

Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala
8705 8710 8715

Thr Ala Asp Gly Thr Gly Phe Gly Glu Gly Ala Ala Val Leu Val
8720 8725 8730

Leu Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val Leu
8735 8740 8745

Ala Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn
8750 8755 8760

Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn
8765 8770 8775

Gln Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala
8780 8785 8790

Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu
8795 8800 8805

Ala Ser Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp
8810 8815 8820

Gln Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr
8825 8830 8835

Gln Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala
8840 8845 8850

Ile Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro
8855 8860 8865

Ser Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr
8870 8875 8880

Glu Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala
8885 8890 8895

Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile Leu
 8900 8905 8910

Gln Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn Thr Thr
 8915 8920 8925

Thr Gly Ser Asp Pro Ala Val Gly Ser Asp Pro Ala Val Gly Val
 8930 8935 8940

Leu Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu Ser Ala
 8945 8950 8955

Gln Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro Asp Leu
 8960 8965 8970

Asp Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser His
 8975 8980 8985

His Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His Ser
 8990 8995 9000

Glu Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His Ala
 9005 9010 9015

Leu Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu Leu
 9020 9025 9030

Thr Pro Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly Gln
 9035 9040 9045

Gly Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln Phe
 9050 9055 9060

Pro Val Phe Ala His Ala Leu Asp Ala Cys Asp Ala Ala Leu Gln
 9065 9070 9075

Pro Phe Thr Gly Trp Ser Val Leu Ala Val Leu His Asp Glu Pro
 9080 9085 9090

Glu Ala Pro Ser Leu Glu Arg Val Asp Val Val Gln Pro Val Leu
 9095 9100 9105

Phe Ser Val Met Val Ser Leu Ala Ala Leu Trp Arg Trp Ala Gly
 9110 9115 9120

Ile Thr Pro Asp Ala Val Ile Gly His Ser Gln Gly Glu Ile Ala
9125 9130 9135

Ala Ala His Val Ala Gly Ala Leu Thr Leu Pro Glu Ala Ala Ala
9140 9145 9150

Val Val Ala Leu Arg Ser Arg Val Leu Thr Asp Leu Ala Gly Ala
9155 9160 9165

Gly Ala Met Ala Ser Val Leu Ser Pro Glu Glu Pro Leu Thr Gln
9170 9175 9180

Leu Leu Ala Arg Trp Asp Gly Lys Ile Thr Val Ala Ala Val Asn
9185 9190 9195

Gly Pro Ala Ser Ala Val Val Ser Gly Asp Thr Thr Ala Ile Thr
9200 9205 9210

Glu Leu Leu Ile Thr Cys Glu His Glu Asn Ile Asp Ala Arg Ala
9215 9220 9225

Ile Pro Val Asp Tyr Pro Ser His Ser Pro Tyr Met Glu His Ile
9230 9235 9240

Arg His Gln Phe Leu Asp Glu Leu Pro Glu Leu Thr Pro Arg Pro
9245 9250 9255

Ser Thr Ile Ala Met Tyr Ser Thr Val Asp Gly Glu Pro His Asp
9260 9265 9270

Thr Ala Tyr Asp Thr Thr Met Thr Ala Asp Tyr Trp Tyr Arg
9275 9280 9285

Asn Ile Arg Asn Thr Val Arg Phe His Asp Thr Val Ala Ala Leu
9290 9295 9300

Leu Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro His Pro
9305 9310 9315

Val Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly Gly
9320 9325 9330

Gly Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp Ala
9335 9340 9345

Val Ala Phe Ala Ala Ala Leu Gly Gln Leu His Cys His Gly Ile
9350 9355 9360

Ser Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu Thr
9365 9370 9375

Leu Pro Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu Pro
9380 9385 9390

Thr Ala Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met His Pro
9395 9400 9405

Leu Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp Val
9410 9415 9420

Phe Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu Asn Glu
9425 9430 9435

His Ala Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly Phe Val
9440 9445 9450

Glu Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser Val
9455 9460 9465

Asn Glu Leu Ile Val His Thr Pro Leu Leu Ala Gly His Asp
9470 9475 9480

Thr Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met Gly
9485 9490 9495

Arg Gln Ser Leu Asn Ile His Ser His Pro His Ile Gly His Asp
9500 9505 9510

Asn Thr Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His Ala
9515 9520 9525

Ser Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu Pro
9530 9535 9540

Leu Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile Glu
9545 9550 9555

Val Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn Tyr
9560 9565 9570

Gly Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His Ala
9575 9580 9585

Thr Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp Thr
9590 9595 9600

Asp Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala Ala
9605 9610 9615

Leu His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp Thr
9620 9625 9630

Asp Asp Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg Leu Pro
9635 9640 9645

Tyr Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr Arg
9650 9655 9660

Leu Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr Val
9665 9670 9675

His Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp Ser
9680 9685 9690

Leu Ile Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala Pro Ala
9695 9700 9705

Thr Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His Pro
9710 9715 9720

Asp Thr Thr Thr Asp Thr Asp Thr Asp Thr Asp Ala Leu Arg Tyr
9725 9730 9735

Arg Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu His
9740 9745 9750

Asp Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Glu Ala
9755 9760 9765

Asp Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu Leu
9770 9775 9780

Gln Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile His
9785 9790 9795

Thr Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu Thr
 9800 9805 9810

His Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg His
 9815 9820 9825

Gly Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala His
 9830 9835 9840

Ala Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His Pro
 9845 9850 9855

Gly Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser Asp
 9860 9865 9870

Thr Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln Leu
 9875 9880 9885

Ala Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg His
 9890 9895 9900

Ser Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp Pro Glu
 9905 9910 9915

Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala Leu
 9920 9925 9930

Phe Ala Glu His Leu Val Ser Ala His Gly Val Arg His Leu Leu
 9935 9940 9945

Leu Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp Leu
 9950 9955 9960

Gln Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr Ala
 9965 9970 9975

Cys Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn Ser
 9980 9985 9990

Val Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala Ala
 9995 10000 10005

Val Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln Leu
 10010 10015 10020

Asp Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu His

10025	10030	10035
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Gln Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe Ser
 10040 10045 10050

Ser Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr Ala
 10055 10060 10065

Ala Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His Arg
 10070 10075 10080

Leu Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln Thr
 10085 10090 10095

His Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala Arg
 10100 10105 10110

Met Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly Leu
 10115 10120 10125

Ala Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser Ile
 10130 10135 10140

Pro Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg Asp
 10145 10150 10155

Asn Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro Arg
 10160 10165 10170

Arg Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu Asn
 10175 10180 10185

Gly Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr Leu Val
 10190 10195 10200

Ala Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu Ser
 10205 10210 10215

Ile Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser Leu
 10220 10225 10230

Thr Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly Leu
 10235 10240 10245

Asp Leu Pro Pro Thr Leu Ile Phe Asp His Pro Thr Pro His Ala

10250 10255 10260

Val Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile Gly Ala Leu
10265 10270 10275

Val Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu Glu Pro
10280 10285 10290

Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly Val Ala
10295 10300 10305

Ser Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg Asp Val
10310 10315 10320

Val Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu
10325 10330 10335

Phe Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr
10340 10345 10350

Gly Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe
10355 10360 10365

Gly Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg
10370 10375 10380

Leu Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile
10385 10390 10395

Pro Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Ala Gly
10400 10405 10410

Ala Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp Ala Glu
10415 10420 10425

Gly Tyr Ala Met Thr Gly Gly Ala Thr Ser Val Met Ser Gly Arg
10430 10435 10440

Ile Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr Val Asp
10445 10450 10455

Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala Cys Gln
10460 10465 10470

Ser Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly Val
10475 10480 10485

Thr Val Met Ser Thr Pro Ala Val Phe Thr Glu Phe Ser Arg Gln
10490 10495 10500

Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala Thr
10505 10510 10515

Ala Asp Gly Thr Gly Phe Gly Glu Gly Ala Ala Val Leu Val Leu
10520 10525 10530

Glu Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val Leu Ala
10535 10540 10545

Ile Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly
10550 10555 10560

Leu Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn Gln
10565 10570 10575

Ala Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala Val
10580 10585 10590

Glu Ala His Gly Thr Gly Thr Leu Gly Asp Pro Ile Glu Ala
10595 10600 10605

Ser Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp Gln
10610 10615 10620

Pro Ile Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln
10625 10630 10635

Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile
10640 10645 10650

Thr His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser
10655 10660 10665

Pro His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr Glu
10670 10675 10680

Pro Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala Val
10685 10690 10695

Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile Leu Gln
10700 10705 10710

Gln Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn Thr Thr Thr
10715 10720 10725

Gly Ser Asp Pro Ala Val Gly Ser Asp Pro Ala Val Gly Val Leu
10730 10735 10740

Val Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu Ser Ala Gln
10745 10750 10755

Ala Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro Asp Leu Asp
10760 10765 10770

Pro Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser His His
10775 10780 10785

Pro His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His Ser Glu
10790 10795 10800

Asn Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His Ala Leu
10805 10810 10815

Ala Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu Leu Thr
10820 10825 10830

Pro Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly Gln Gly
10835 10840 10845

Ser Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln Phe Pro
10850 10855 10860

Val Phe Ala His Ala Leu Asp Ala Cys Asp Ala Ala Leu Gln Pro
10865 10870 10875

Phe Thr Gly Trp Ser Val Leu Ala Val Leu His Asp Glu Pro Glu
10880 10885 10890

Ala Pro Ser Leu Glu Arg Val Asp Val Val Gln Pro Val Leu Phe
10895 10900 10905

Ser Val Met Val Ser Leu Ala Ala Leu Trp Arg Trp Ala Gly Ile
10910 10915 10920

Thr Pro Asp Ala Val Ile Gly His Ser Gln Gly Glu Ile Ala Ala
10925 10930 10935

Ala His Val Ala Gly Ala Leu Thr Leu Pro Glu Ala Ala Ala Val
10940 10945 10950

Val Ala Leu Arg Ser Arg Val Leu Thr Asp Leu Ala Gly Ala Gly
10955 10960 10965

Ala Met Ala Ser Val Leu Ser Pro Glu Glu Pro Leu Thr Gln Leu
10970 10975 10980

Leu Ala Arg Trp Asp Gly Lys Ile Thr Val Ala Ala Val Asn Gly
10985 10990 10995

Pro Ala Ser Ala Val Val Ser Gly Asp Thr Thr Ala Ile Thr Glu
11000 11005 11010

Leu Leu Ile Thr Cys Glu His Glu Asn Ile Asp Ala Arg Ala Ile
11015 11020 11025

Pro Val Asp Tyr Pro Ser His Ser Pro Tyr Met Glu His Ile Arg
11030 11035 11040

His Gln Phe Leu Asp Glu Leu Pro Glu Leu Thr Pro Arg Pro Ser
11045 11050 11055

Thr Ile Ala Met Tyr Ser Thr Val Asp Gly Glu Pro His Asp Thr
11060 11065 11070

Ala Tyr Asp Thr Thr Met Thr Ala Asp Tyr Trp Tyr Arg Asn
11075 11080 11085

Ile Arg Asn Thr Val Arg Phe His Asp Thr Val Ala Ala Leu Leu
11090 11095 11100

Gly Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro His Pro Val
11105 11110 11115

Leu Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly Gly Gly
11120 11125 11130

Gly Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp Ala Val
11135 11140 11145

Ala Phe Ala Ala Ala Leu Gly Gln Leu His Cys His Gly Ile Ser
11150 11155 11160

Pro Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu Thr Leu
11165 11170 11175

Pro Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu Pro Thr
11180 11185 11190

Ala Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met His Pro Leu
11195 11200 11205

Leu Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp Val Phe
11210 11215 11220

Thr Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu Asn Glu His
11225 11230 11235

Ala Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly Phe Val Glu
11240 11245 11250

Leu Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser Val Asn
11255 11260 11265

Glu Leu Ile Val His Thr Pro Leu Leu Leu Ala Gly His Asp Thr
11270 11275 11280

Ala Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met Gly Arg
11285 11290 11295

Gln Ser Leu Asn Ile His Ser Arg Pro His Ile Gly His Asp Asn
11300 11305 11310

Thr Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His Ala Ser
11315 11320 11325

Ala Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu Pro Leu
11330 11335 11340

Thr Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile Glu Val
11345 11350 11355

Asp Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn Tyr Gly
11360 11365 11370

Pro Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His Ala Thr
11375 11380 11385

Pro Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp Thr Asp

11390 11395 11400

Ile Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala Ala Leu
11405 11410 11415

His Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp Thr Asp
11420 11425 11430

Asp Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg Leu Pro Tyr
11435 11440 11445

Ala Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr Arg Leu
11450 11455 11460

Arg Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr Val His
11465 11470 11475

Thr Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp Ser Leu
11480 11485 11490

Ile Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala Pro Ala Thr
11495 11500 11505

Thr Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His Pro Asp
11510 11515 11520

Thr Thr Thr Asp Thr Asp Thr Asp Thr Asp Ala Leu Arg Tyr Gln
11525 11530 11535

Val Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu His Asp
11540 11545 11550

Leu His Thr Ser Thr Asp Leu His Thr Ser Thr Thr Glu Ala Asp
11555 11560 11565

Val Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu Leu Gln
11570 11575 11580

Ala His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile His Thr
11585 11590 11595

Leu Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu Thr His
11600 11605 11610

Pro Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg His Gly
11615 11620 11625

Val Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala His Ala
11630 11635 11640

Ala Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His Pro Gly
11645 11650 11655

Arg Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser Asp Thr
11660 11665 11670

Leu Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln Leu Ala
11675 11680 11685

Ile Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg His Ser
11690 11695 11700

Ser Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp Pro Glu Gly
11705 11710 11715

Thr Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala Leu Phe
11720 11725 11730

Ala Glu His Leu Val Ser Ala His Gly Val Arg His Leu Leu Leu
11735 11740 11745

Thr Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp Leu Gln
11750 11755 11760

Gln Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr Ala Cys
11765 11770 11775

Asp Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn Ser Val
11780 11785 11790

Pro Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala Ala Val
11795 11800 11805

Leu Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln Leu Asp
11810 11815 11820

Gln Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu His Gln
11825 11830 11835

Leu Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe Ser Ser
11840 11845 11850

Met Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr Ala Ala
 11855 11860 11865

Ala Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His Arg Leu
 11870 11875 11880

Gly Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln Thr His
 11885 11890 11895

Thr Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala Arg Met
 11900 11905 11910

Thr Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly Leu Ala
 11915 11920 11925

Leu Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser Ile Pro
 11930 11935 11940

Ala Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg Asp Asn
 11945 11950 11955

Thr Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro Arg Arg
 11960 11965 11970

Arg Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu Asn Gly
 11975 11980 11985

Leu Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr Leu Val Ala
 11990 11995 12000

Ala Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu Ser Ile
 12005 12010 12015

Ser Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser Leu Thr
 12020 12025 12030

Ala Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly Leu Asp
 12035 12040 12045

Leu Pro Pro Thr Leu Ile Phe Asp His Pro Thr Pro His Ala Val
 12050 12055 12060

Ala Glu His Leu Leu Glu Gln Ile Pro Gly Ile Gly Ala Leu Val
 12065 12070 12075

Pro Ala Pro Val Val Ile Ala Ala Gly Arg Thr Glu Glu Pro Val
 12080 12085 12090

Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Gly Val Ala Ser
 12095 12100 12105

Ala Asp Gln Leu Trp Asp Leu Val Ile Ala Gly Arg Asp Val Val
 12110 12115 12120

Gly Asn Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu Phe
 12125 12130 12135

Asp Pro Asp Pro Asp Ala Val Gly Lys Thr Tyr Thr Arg Tyr Gly
 12140 12145 12150

Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Gly Phe Phe Gly
 12155 12160 12165

Ile Ser Pro Arg Glu Ala Arg Ala Met Asp Pro Gln Gln Arg Leu
 12170 12175 12180

Leu Leu Glu Val Cys Trp Glu Ala Leu Glu Thr Ala Gly Ile Pro
 12185 12190 12195

Ala His Thr Leu Ala Gly Thr Ser Thr Gly Val Phe Ala Gly Ala
 12200 12205 12210

Trp Ala Gln Ser Tyr Gly Ala Thr Asn Ser Asp Asp Ala Glu Gly
 12215 12220 12225

Tyr Ala Met Thr Gly Gly Ala Thr Ser Val Met Ser Gly Arg Ile
 12230 12235 12240

Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Ile Thr Val Asp Thr
 12245 12250 12255

Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala Cys Gln Ser
 12260 12265 12270

Leu Arg Asn Asn Glu Ser Gln Leu Ala Leu Ala Gly Gly Val Thr
 12275 12280 12285

Val Met Ser Thr Pro Ala Val Phe Thr Glu Phe Ser Arg Gln Arg
 12290 12295 12300

Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Ala Thr Ala
12305 12310 12315

Asp Gly Thr Gly Phe Gly Glu Gly Ala Ala Val Leu Val Leu Glu
12320 12325 12330

Arg Leu Ser Glu Ala Arg Arg Asn Asn His Pro Val Leu Ala Ile
12335 12340 12345

Val Ala Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu
12350 12355 12360

Thr Ala Pro His Gly Pro Ser Gln Gln Arg Val Ile Asn Gln Ala
12365 12370 12375

Leu Ala Asn Ala Gly Leu Thr His Asp Gln Val Asp Ala Val Glu
12380 12385 12390

Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala Ser
12395 12400 12405

Ala Leu His Ala Thr Tyr Gly His His His Thr Pro Asp Gln Pro
12410 12415 12420

Leu Trp Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr Gln Ala
12425 12430 12435

Ala Ala Gly Ala Ala Gly Val Val Lys Met Ile Gln Ala Ile Thr
12440 12445 12450

His Ala Thr Leu Pro Ala Thr Leu His Val Asp Gln Pro Ser Pro
12455 12460 12465

His Ile Asp Trp Ser Ser Gly Thr Val Arg Leu Leu Thr Glu Pro
12470 12475 12480

Ile Gln Trp Pro Asn Thr Asp His Pro Arg Thr Ala Ala Val Ser
12485 12490 12495

Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Ile Leu Gln Gln
12500 12505 12510

Pro Pro Thr Pro Asp Thr Thr Gln Thr Pro Asn Thr Thr Thr Gly
12515 12520 12525

Ser Asp Pro Ala Val Gly Ser Asp Pro Ala Val Gly Val Leu Val

12530 12535 12540

Trp Pro Leu Ser Ala Arg Ser Ala Pro Gly Leu Ser Ala Gln Ala
12545 12550 12555

Ala Arg Leu Tyr Gln His Leu Ser Ala His Pro Asp Leu Asp Pro
12560 12565 12570

Ile Asp Val Ala His Ser Leu Ala Thr Thr Arg Ser His His Pro
12575 12580 12585

His Arg Ala Thr Ile Thr Thr Ser Ile Glu His His Ser Glu Asn
12590 12595 12600

Asn His Asp Thr Thr Asp Ala Leu Ala Ala Leu His Ala Leu Ala
12605 12610 12615

Asn Asn Gly Thr His Pro Leu Leu Ser Arg Gly Leu Leu Thr Pro
12620 12625 12630

Gln Gly Pro Gly Lys Thr Val Phe Val Phe Pro Gly Gln Gly Ser
12635 12640 12645

Gln Tyr Pro Gly Met Gly Ala Asp Leu Tyr Arg Gln Phe Pro Val
12650 12655 12660

Phe Ala His Ala Leu Asp Glu Val Ala Ala Ala Leu Asn Pro His
12665 12670 12675

Leu Asp Val Ala Leu Leu Glu Val Met Phe Ser Gln Gln Asp Thr
12680 12685 12690

Ala Met Ala Gln Leu Leu Asp Gln Thr Phe Tyr Ala Gln Pro Ala
12695 12700 12705

Leu Phe Ala Leu Gly Thr Ala Leu His Arg Leu Phe Thr His Ala
12710 12715 12720

Gly Ile His Pro Asp Tyr Leu Leu Gly His Ser Ile Gly Glu Leu
12725 12730 12735

Thr Ala Ala Tyr Ala Ala Gly Val Leu Ser Leu Gln Asp Ala Ala
12740 12745 12750

Thr Leu Val Thr Ser Arg Gly Arg Leu Met Gln Ser Cys Thr Pro
12755 12760 12765

Gly Gly Thr Met Leu Ala Leu Gln Ala Ser Glu Ala Glu Val Gln
12770 12775 12780

Pro Leu Leu Glu Gly Leu Asp His Ala Val Ser Ile Ala Ala Ile
12785 12790 12795

Asn Gly Ala Thr Ser Ile Val Leu Ser Gly Asp His Asp Ser Leu
12800 12805 12810

Glu Gln Ile Gly Glu His Phe Ile Thr Gln Asp Arg Arg Thr Thr
12815 12820 12825

Arg Leu Gln Val Ser His Ala Phe His Ser Pro His Met Asp Pro
12830 12835 12840

Ile Leu Glu Gln Phe Arg Gln Ile Ala Ala Gln Leu Thr Phe Ser
12845 12850 12855

Ala Pro Thr Leu Pro Ile Leu Ser Asn Leu Thr Gly Gln Ile Ala
12860 12865 12870

Arg His Asp Gln Leu Ala Ser Pro Asp Tyr Trp Thr Gln Gln Leu
12875 12880 12885

Arg Asn Thr Val Arg Phe His Asp Thr Val Ala Ala Leu Leu Gly
12890 12895 12900

Ala Gly Glu Gln Val Phe Leu Glu Leu Ser Pro His Pro Val Leu
12905 12910 12915

Thr Gln Ala Ile Thr Asp Thr Val Glu Gln Ala Gly Gly Gly Gly
12920 12925 12930

Ala Ala Val Pro Ala Leu Arg Lys Asp Arg Pro Asp Ala Val Ala
12935 12940 12945

Phe Ala Ala Ala Leu Gly Gln Leu His Cys His Gly Ile Ser Pro
12950 12955 12960

Ser Trp Asn Val Leu Tyr Cys Gln Ala Arg Pro Leu Thr Leu Pro
12965 12970 12975

Thr Tyr Ala Phe Gln His Gln Arg Tyr Trp Leu Leu Pro Thr Ala
12980 12985 12990

Gly Asp Phe Ser Gly Ala Asn Thr His Ala Met His Pro Leu Leu
12995 13000 13005

Asp Thr Ala Thr Glu Leu Ala Glu Asn Arg Gly Trp Val Phe Thr
13010 13015 13020

Gly Arg Ile Ser Pro Arg Thr Gln Pro Trp Leu Asn Glu His Ala
13025 13030 13035

Val Glu Ser Ala Val Leu Phe Pro Gly Thr Gly Phe Val Glu Leu
13040 13045 13050

Ala Leu His Val Ala Asp Arg Ala Gly Tyr Ser Ser Val Asn Glu
13055 13060 13065

Leu Ile Val His Thr Pro Leu Leu Ala Gly His Asp Thr Ala
13070 13075 13080

Asp Leu Gln Ile Thr Val Thr Asp Thr Asp Asp Met Gly Arg Gln
13085 13090 13095

Ser Leu Asn Ile His Ser Arg Pro His Ile Gly His Asp Asn Thr
13100 13105 13110

Thr Thr Gly Asp Glu Gln Pro Glu Trp Val Leu His Ala Ser Ala
13115 13120 13125

Val Leu Thr Ala Gln Thr Thr Asp His Asn His Leu Pro Leu Thr
13130 13135 13140

Pro Val Pro Trp Pro Pro Pro Gly Thr Ala Ala Ile Glu Val Asp
13145 13150 13155

Asp Phe Tyr Asp Asp Leu Ala Ala Gln Gly Tyr Asn Tyr Gly Pro
13160 13165 13170

Thr Phe Gln Gly Val Gln Arg Ile Trp Arg Asp His Ala Thr Pro
13175 13180 13185

Asp Val Ile Tyr Ala Glu Val Glu Leu Pro Glu Asp Thr Asp Ile
13190 13195 13200

Asp Gly Tyr Gly Ile His Pro Ala Leu Phe Asp Ala Ala Leu His
13205 13210 13215

Pro Leu Leu Ala Leu Thr Gln Pro Pro Thr Asn Asp Thr Asp Asp
13220 13225 13230

Thr Asn Thr Ala Asp Thr Gly Asp Gln Val Arg Leu Pro Tyr Ala
13235 13240 13245

Phe Thr Gly Ile Ser Leu His Ala Thr His Ala Thr Arg Leu Arg
13250 13255 13260

Val Arg Leu Thr Arg Thr Gly Ala Asp Ala Ile Thr Val His Thr
13265 13270 13275

Ser Asp Thr Thr Gly Ala Pro Val Ala Ile Ile Asp Ser Leu Ile
13280 13285 13290

Thr Arg Pro Leu Thr Thr Ala Thr Gly Ser Ala Pro Ala Thr Thr
13295 13300 13305

Ala Ala Gly Leu Leu His Leu Ser Trp Pro Pro His Pro Asp Thr
13310 13315 13320

Thr Thr Asp Thr Asp Thr Asp Thr Asp Ala Leu Arg Tyr Gln Val
13325 13330 13335

Ile Ala Glu Pro Thr Gln Gln Leu Pro Arg Tyr Leu His Asp Leu
13340 13345 13350

His Thr Ser Thr Asp Leu His Thr Ser Thr Thr Glu Ala Asp Val
13355 13360 13365

Val Val Trp Pro Val Pro Val Pro Ser Asn Glu Glu Leu Gln Ala
13370 13375 13380

His Gln Ala Ser Asp Thr Ala Val Ser Ser Arg Ile His Thr Leu
13385 13390 13395

Thr Arg Gln Thr Leu Thr Val Val Gln Asp Trp Leu Thr His Pro
13400 13405 13410

Asp Thr Thr Gly Thr Arg Leu Val Ile Val Thr Arg His Gly Val
13415 13420 13425

Ser Thr Ser Ala His Asp Pro Val Pro Asp Leu Ala His Ala Ala
13430 13435 13440

Val Trp Gly Leu Ile Arg Ser Ala Gln Asn Glu His Pro Gly Arg
13445 13450 13455

Phe Thr Leu Leu Asp Thr Asp Asp Asn Thr Asn Ser Asp Thr Leu
13460 13465 13470

Thr Thr Ala Leu Thr Leu Pro Thr Arg Glu Asn Gln Leu Ala Ile
13475 13480 13485

Arg Arg Asp Thr Ile His Ile Pro Arg Leu Thr Arg His Ser Ser
13490 13495 13500

Asp Gly Ala Leu Thr Ala Pro Val Val Val Asp Pro Glu Gly Thr
13505 13510 13515

Val Leu Ile Thr Gly Gly Thr Gly Thr Leu Gly Ala Leu Phe Ala
13520 13525 13530

Glu His Leu Val Ser Ala His Gly Val Arg His Leu Leu Leu Thr
13535 13540 13545

Ser Arg Arg Gly Pro Gln Ala His Gly Ala Thr Asp Leu Gln Gln
13550 13555 13560

Arg Leu Thr Asp Leu Gly Ala His Val Thr Ile Thr Ala Cys Asp
13565 13570 13575

Ile Ser Asp Pro Glu Ala Leu Ala Ala Leu Val Asn Ser Val Pro
13580 13585 13590

Thr Gln His Arg Leu Thr Ala Val Val His Thr Ala Ala Val Leu
13595 13600 13605

Ala Asp Thr Pro Val Thr Glu Leu Thr Gly Asp Gln Leu Asp Gln
13610 13615 13620

Val Leu Ala Pro Lys Ile Asp Ala Ala Trp Gln Leu His Gln Leu
13625 13630 13635

Thr Tyr Glu His Asn Leu Ser Ala Phe Ile Met Phe Ser Ser Met
13640 13645 13650

Ala Gly Met Ile Gly Ser Pro Gly Gln Gly Asn Tyr Ala Ala Ala
13655 13660 13665

Asn Thr Ala Leu Asp Ala Leu Ala Asp Tyr Arg His Arg Leu Gly

13670 13675 13680

Leu Pro Ala Thr Ser Leu Ala Trp Gly Tyr Trp Gln Thr His Thr
13685 13690 13695

Gly Leu Thr Ala His Leu Thr Asp Val Asp Leu Ala Arg Met Thr
13700 13705 13710

Arg Leu Gly Leu Met Pro Ile Ala Thr Ser His Gly Leu Ala Leu
13715 13720 13725

Phe Asp Ala Ala Leu Ala Thr Gly Gln Pro Val Ser Ile Pro Ala
13730 13735 13740

Pro Ile Asn Thr His Thr Leu Ala Arg His Ala Arg Asp Asn Thr
13745 13750 13755

Leu Ala Pro Ile Leu Ser Ala Leu Ile Thr Thr Pro Arg Arg Arg
13760 13765 13770

Ala Ala Ser Ala Ala Thr Asp Leu Ala Ala Arg Leu Asn Gly Leu
13775 13780 13785

Ser Pro Gln Gln Gln Gln Thr Leu Ala Thr Leu Val Ala Ala
13790 13795 13800

Ala Thr Ala Thr Val Leu Gly His His Thr Pro Glu Ser Ile Ser
13805 13810 13815

Pro Ala Thr Ala Phe Lys Asp Leu Gly Ile Asp Ser Leu Thr Ala
13820 13825 13830

Leu Glu Leu Arg Asn Thr Leu Thr His Asn Thr Gly Leu Asp Leu
13835 13840 13845

Pro Pro Thr Leu Ile Phe Asp His Pro Thr Pro His Ala Leu Thr
13850 13855 13860

Gln His Leu His Thr Arg Leu Thr Gln Ser His Thr Pro Val Gly
13865 13870 13875

Pro Ile Ala Ser Leu Leu Ser His Ala Ile Asp Glu Gly Lys Phe
13880 13885 13890

Arg Ala Gly Ala Asp Leu Leu Met Ala Ala Ser Asn Leu Asn Gln

13895 13900 13905

Ser Phe Ser Asn Met Ala Glu Leu Asn Gln Leu Pro Ala Val Thr
13910 13915 13920

Asp Ile Ala Asp Ala Ser Pro Asp Gly Leu Leu Thr Leu Ile Cys
13925 13930 13935

Ile Ser Thr Ser Glu Asn Glu Tyr Ala Arg Leu Ala Ala Ala Asn
13940 13945 13950

Ile His Ser Leu Thr Phe Ala Glu Ile Ala Ala Pro Gly Phe Tyr
13955 13960 13965

Asp Ala Gln Leu Pro Asn Ser Ile Glu Thr Ser Ala Glu Ala Leu
13970 13975 13980

Ala Thr Ala Ile Thr Gly Ala Tyr Ala Asn Thr Ser Ile Val Leu
13985 13990 13995

Val Ala His Ser Ile Val Cys Glu Leu Ala Gln Ala Thr Met Thr
14000 14005 14010

Arg Leu Gln Asp Ala Asp Ile Asp Leu Val Gly Leu Val Leu Leu
14015 14020 14025

Asp Pro Leu Glu Gly Thr Asn Ser Thr Glu Asp Tyr Val Glu Thr
14030 14035 14040

Val Leu Thr Arg Ile Glu His Ile Asn Ala Pro Arg Val Gly Val
14045 14050 14055

Asp Gly Tyr Leu Ala Ala Leu Gly Arg Tyr Leu Gln Phe His Glu
14060 14065 14070

Asp Arg Arg Ile Pro Ile Pro Glu Thr Arg His Met Thr Leu His
14075 14080 14085

Ser Asp Thr Lys Ile Asp Arg Ala Gln Thr Pro Met Asn Leu Leu
14090 14095 14100

Gln Asp Glu Ala Ala Leu Thr Ala Leu Lys Ile Gly Asn Trp Met
14105 14110 14115

Asn Asp Val Gly Val Ala Leu Ser Val Asn Leu Glu
14120 14125 14130

<210> 10
<211> 328

<212> PRT
<213> Mycobacterium ulcerans

<220>

<223> Amino acid sequence of the protein encoded by *mup045* gene.

<400> 10

Val Ile Trp Asn Asp Ile Tyr Ile Ser Gly Thr Gly Arg Phe Ile Pro
1 5 10 15

Ser Met Arg Pro Ile Asn Asp Ile Gln Val Asp Gly Val Pro Asn Asp
20 25 30

His Thr Ile Val Gln Ser Asp Tyr Ile Ser Phe Thr Glu Ala Asp Glu
35 40 45

Pro Ala Thr Val Met Ala Thr Arg Ala Ala Thr Glu Ala Leu Thr Thr
50 55 60

Ser Glu Leu Val Ser Ala Asp Val Gly Val Leu Ile Tyr Ala Ala Ile
65 70 75 80

Ile Gly Asp Ala His His Phe Ala Pro Val Cys His Val Gln Arg Val
85 90 95

Leu Arg Ala Pro Asp Ala Leu Ala Phe Glu Leu Ser Ala Ala Ser Asn
100 105 110

Gly Gly Thr Gln Gly Ile Ala Val Ala Ala Asn Leu Met Thr Ala Asp
115 120 125

Ala Ser Val Lys Ala Ala Leu Val Cys Thr Ala Tyr Arg His Pro Ile
130 135 140

Asp Ile Ile Ser Arg Trp Ser Ser Gly Met Val Phe Gly Asp Gly Ala
145 150 155 160

Ala Ala Ala Val Leu Ser Arg Asp Gly Gly Met Val Arg Leu Ile Ser
165 170 175

Gly Tyr His Gly Ser Leu Pro Glu Leu Glu Val Leu Ala Arg Asn Arg
180 185 190

Ser Asn Glu Arg Leu Gly Phe Val Leu Pro Asp Val Gly Leu Gly Lys

195

200

205

Tyr Leu Thr Ala Ile Ala Arg Met Tyr Gln Ala Val Ile Ala Gln Val
210 215 220

Leu Glu Glu Ala Gln Thr Ser Ile Ala Glu Ile Asp Tyr Phe Gly Leu
225 230 235 240

Ile Gly Ile Gly Ile Pro Ser Leu Thr Ala Thr Ile Leu Glu Pro Asn
245 250 255

Gly Ile Pro Val Asn Lys Thr Ser Trp Gly Leu Leu Arg Gln Met Gly
260 265 270

His Val Gly Ala Cys Asp Pro Leu Leu Ser Leu Asn His Leu Phe Glu
275 280 285

Gln Asn Val Leu Lys Arg Gly Asp Lys Val Leu Leu Gly Gly Gly
290 295 300

Val Gly Tyr Arg Leu Thr Cys Ile Val Ala Glu Ile Ala Met Asn Pro
305 310 315 320

Gly Val Pro Gly His Ser Thr Ser
325

<210> 11
<211> 437
<212> PRT
<213> Mycobacterium ulcerans

<220>
<223> Amino acid sequence of the protein encoded by *mup053* gene.

<400> 11

Val Arg Gln Arg Leu Asn Trp Ile Ala Ala His Gly Leu Leu Arg Gly
1 5 10 15

Thr Ala Arg Leu Ala Ala Arg Leu Gly Asp Val Gln Ser Arg Leu Val
20 25 30

Ala Asp Pro Met Val Met Ala Asn Pro Ala Pro Phe Cys Asp Glu Leu
35 40 45

Arg Ala Ile Gly Pro Val Val Ser Ser Tyr Gly Thr His Leu Val Val
50 55 60

Ser His Ala Ile Ala His Glu Leu Leu Arg Ser Glu Asp Phe Glu Val
65 70 75 80

Val Ser Leu Gly Ser Asn Leu Pro Ala Pro Met Arg Trp Leu Glu Arg
85 90 95

Arg Thr Arg Asp Asp Thr Pro His Leu Leu Leu Pro Pro Ser Leu Leu
100 105 110

Ala Val Glu Pro Pro Asn His Thr Arg Tyr Arg Lys Ala Val Ser Ser
115 120 125

Val Phe Thr Pro Lys Ala Val Ala Gly Leu Arg Asp His Val Glu Glu
130 135 140

Thr Ala Ser Ala Leu Leu Asp Gln Leu Thr Asp Gln Ala Ser Ala Val
145 150 155 160

Asp Ile Ile Ala Arg Tyr Cys Ser Gln Leu Pro Val Ala Val Ile Cys
165 170 175

Asp Ile Leu Gly Val Pro Ser Arg Asp Arg Asn Arg Val Leu Lys Phe
180 185 190

Gly Gln Leu Ala Gly Pro Cys Leu Asp Phe Gly Leu Thr Trp Arg Gln
195 200 205

His Gln Gln Val Arg Gln Gly Leu Gln Gly Leu His Phe Trp Ile Thr
210 215 220

Glu His Leu Glu Glu Leu Arg Ser Asn Pro Gly Asp Asp Leu Met Ser
225 230 235 240

Gln Met Ile His Ala Ser Glu Asn Gly Ser Ser Glu Thr His Leu His
245 250 255

Ala Thr Glu Val Arg Met Ile Gly Leu Val Leu Gly Ala Ser Phe Ala
260 265 270

Thr Thr Met Asp Leu Leu Gly Asn Gly Ile Gln Val Leu Leu Asp Ala
275 280 285

Pro Glu Leu Arg Asp Ala Leu Ser Gln Arg Pro Gln Leu Trp Pro Asn
290 295 300

Ala Val Glu Glu Ile Leu Arg Leu Glu Pro Pro Val Gln Leu Ala Gly
305 310 315 320

Arg Met Ala Arg Lys Asp Thr Glu Val Ala Gly Thr Ala Ile Lys Arg
325 330 335

Gly Gln Leu Val Ala Ile Tyr Leu Gly Ala Val Asn Arg Asp Pro Ser
340 345 350

Val Phe Ala Asp Pro His Arg Phe Asp Ile Thr Arg Ala Asn Ala Asn
355 360 365

Arg His Leu Ala Phe Ser Gly Gly Arg His Phe Cys Leu Gly Ala Ala
370 375 380

Leu Ala Arg Val Glu Gly Glu Val Gly Leu Arg Met Leu Phe Glu Arg
385 390 395 400

Phe Pro Asp Val Arg Ala Ala Gly Pro Gly Asn Arg Arg Asp Thr Arg
405 410 415

Thr Leu Arg Gly Trp Ser Gln Leu Pro Val Gln Leu Gly Ala Ala Arg
420 425 430

Ser Met Ala Ile Arg
435

<210> 12

<211> 301

<212> PRT

<213> *Mycobacterium ulcerans*

<220>

<223> Amino acid sequence of the protein encoded by *mup038* gene.

<400> 12

Met Ile Val Trp Pro Glu Val Val Ser Thr Val Val Asp Val Asp Gly
1 5 10 15

Val Ala Met Ser Ala Leu Val Ala Glu Pro Asp Gln Glu Pro Lys Ala
20 25 30

Val Ile Leu Ala Leu His Gly Gly Ala Thr Asn Ala Arg Tyr Phe Asp
35 40 45

Cys Pro Gly His Arg Ala Leu Ser Leu Leu His Thr Gly Ala Ala Ala
50 55 60

Gly Phe Thr Val Val Ala Leu Asp Arg Pro Gly Tyr Gly Ser Ser Ala
65 70 75 80

Gly Asp Pro Asp Ala Met Asn Arg Pro His Gln Arg Ala Ala Leu Ala
85 90 95

Tyr Gly Ala Leu Asp Arg Ile Leu Ala Gln Arg Pro Arg Gly Ala Gly
100 105 110

Val Phe Ile Met Gly His Ser Asn Gly Cys Glu Leu Ala Met Trp Met
115 120 125

Ala Thr Glu Thr Arg Gly Ala Glu Leu Leu Gly Ile Glu Leu Ala Gly
130 135 140

Thr Gly Trp His Tyr Gln Pro Glu Ala Arg Glu Ile Leu Thr Thr Ala
145 150 155 160

Thr Gly Glu His Arg Trp Val Gly Leu Tyr Asp Leu Leu Trp His Pro
165 170 175

Gln Arg Leu Tyr Pro Pro Glu Val Leu Asn Ala Ala Ile Ile Ser Ser
180 185 190

Ser Ala Pro Ala Tyr Glu Glu Gln Met Met Ala Asp Trp Thr Arg Arg
195 200 205

Thr Phe Leu Glu Leu Val Pro Ala Val Arg Val Pro Val His Phe Ser
210 215 220

Ile Ala Gln His Glu Lys Val Trp Gln Arg Asp Ser Ser Ala Leu Asp
225 230 235 240

Glu Ile Ala Val Leu Phe Ser Gly Ala Pro Arg Phe Ile Leu His Glu
245 250 255

Gln Pro Glu Ala Gly His Asn Ile Ser Leu Gly His Thr Ala Gly Asp
260 265 270

Tyr His Thr Thr Val Leu Ser Phe Val Gln Gln Cys Leu Ala Glu Arg
275 280 285

Leu Ala Asn Ala Gln Gln Asp Val Asp Leu Ala Ala Glu
290 295 300